

THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

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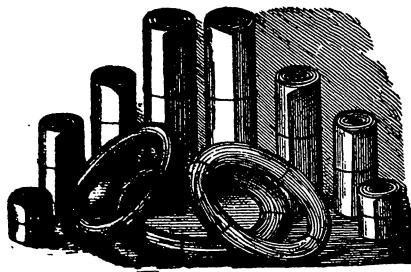
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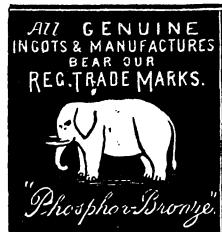
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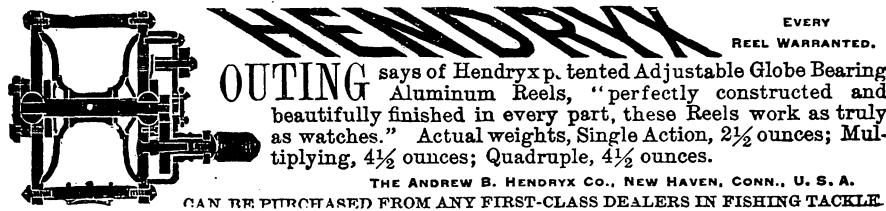
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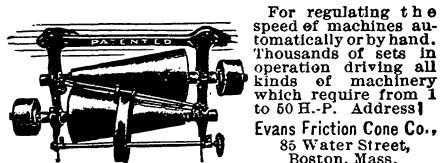
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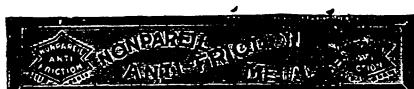
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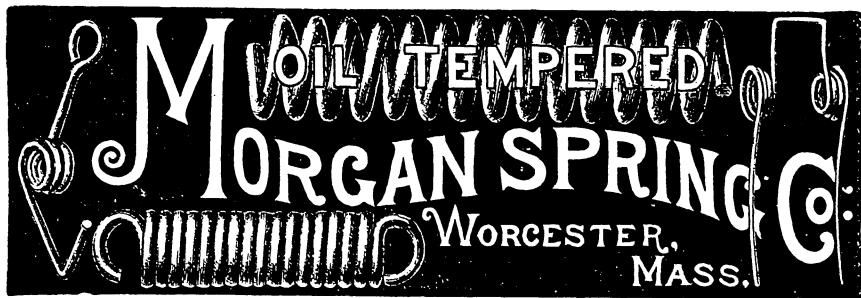
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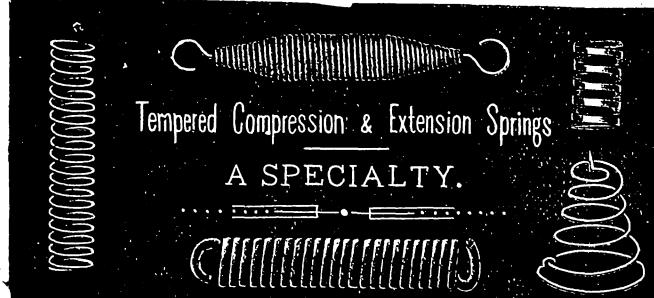


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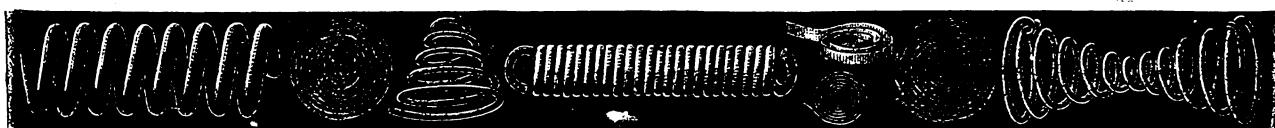
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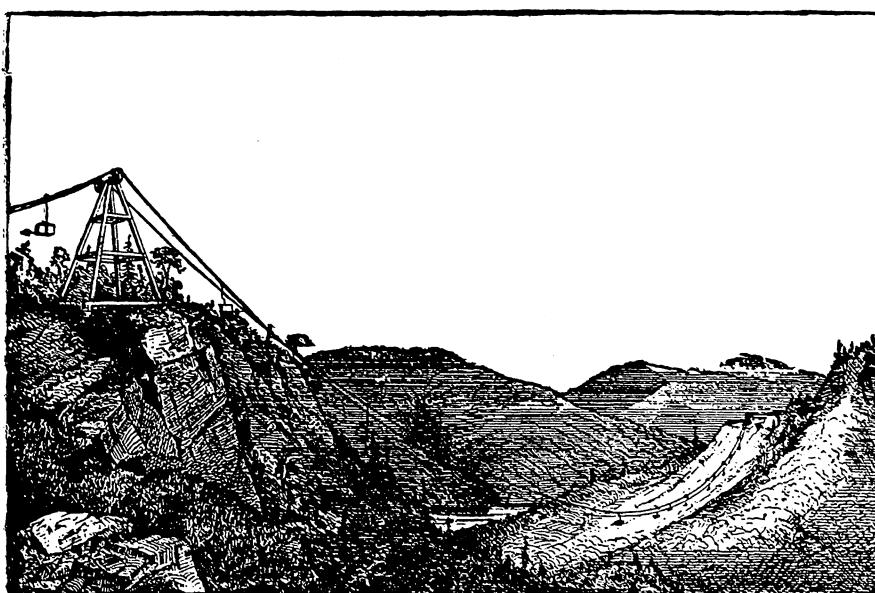
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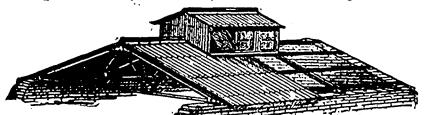
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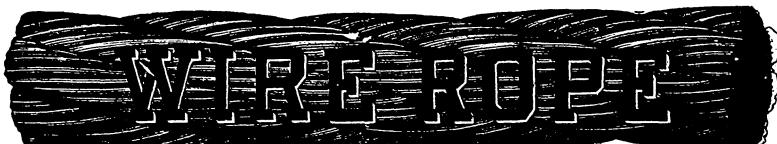
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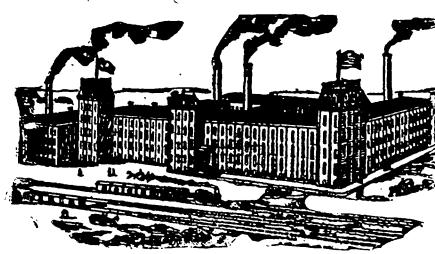
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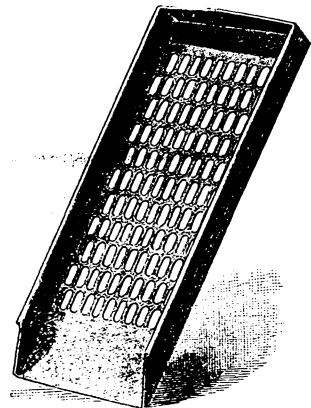
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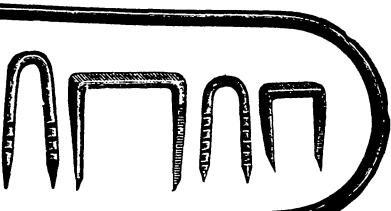
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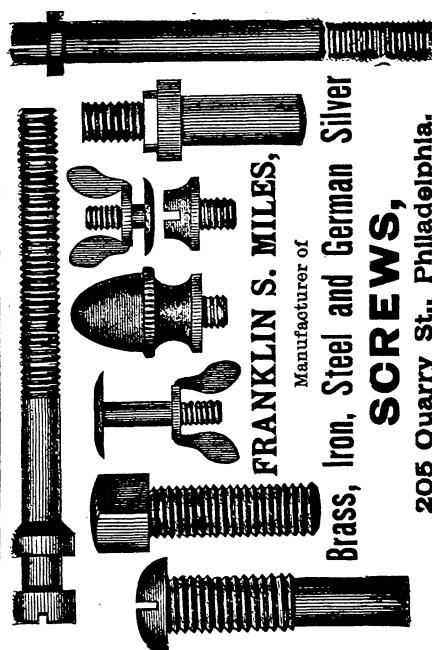
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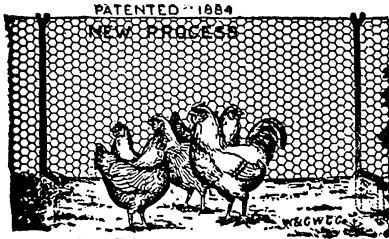
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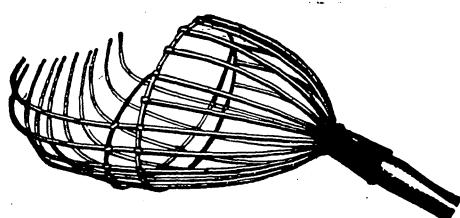
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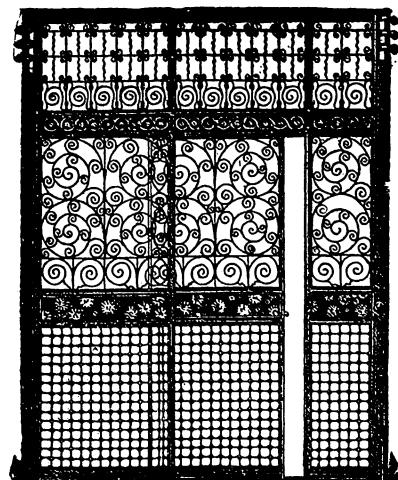
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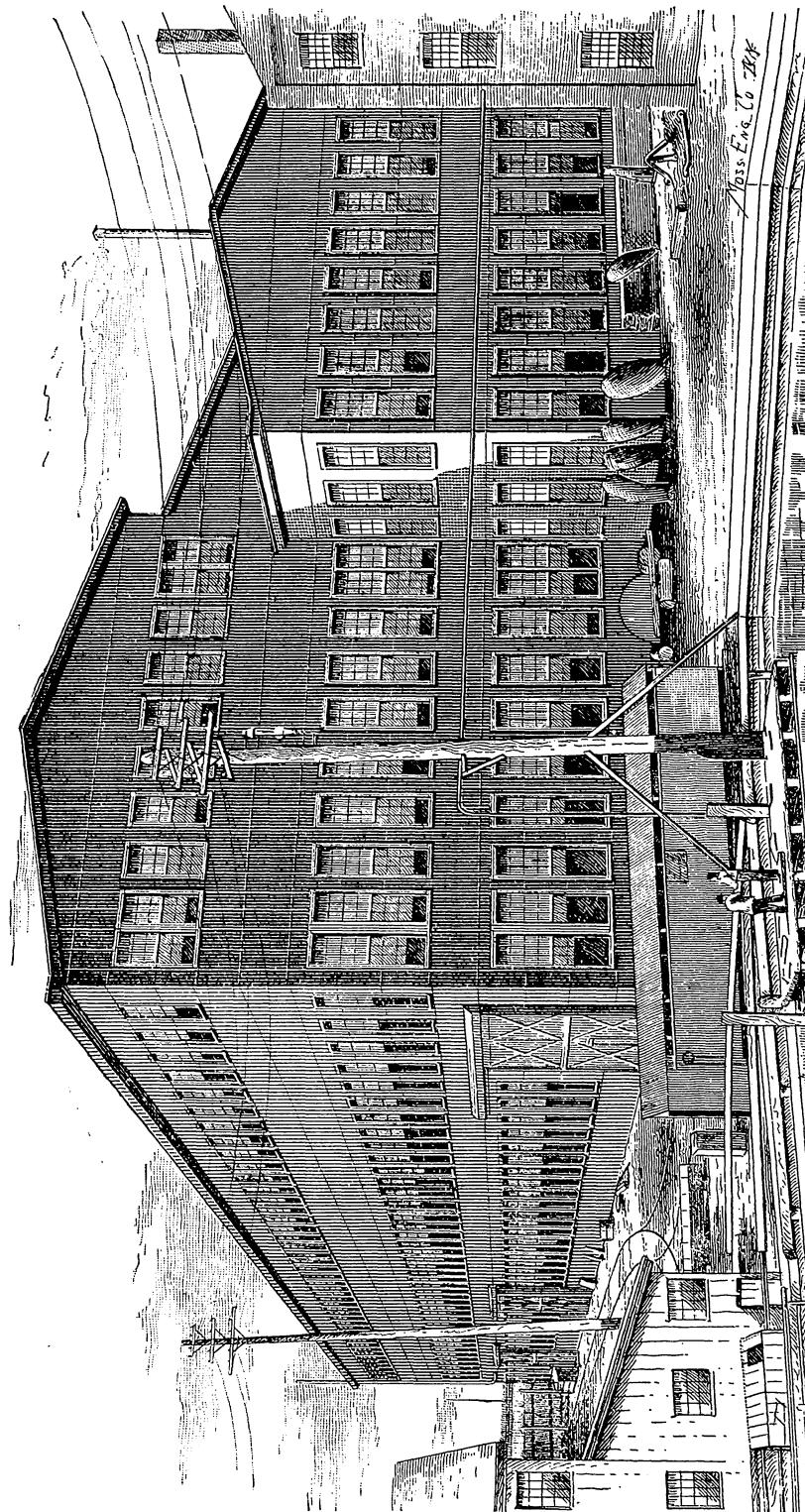
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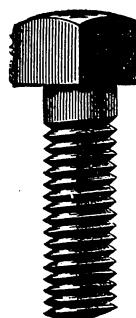
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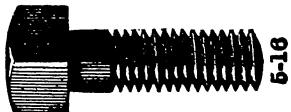
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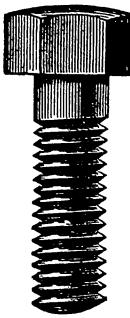


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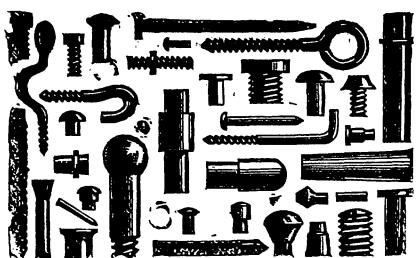
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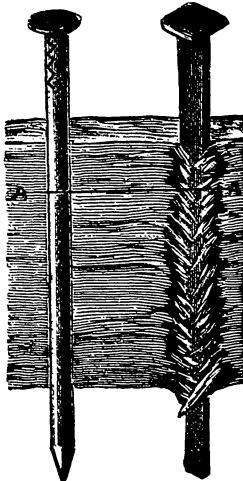
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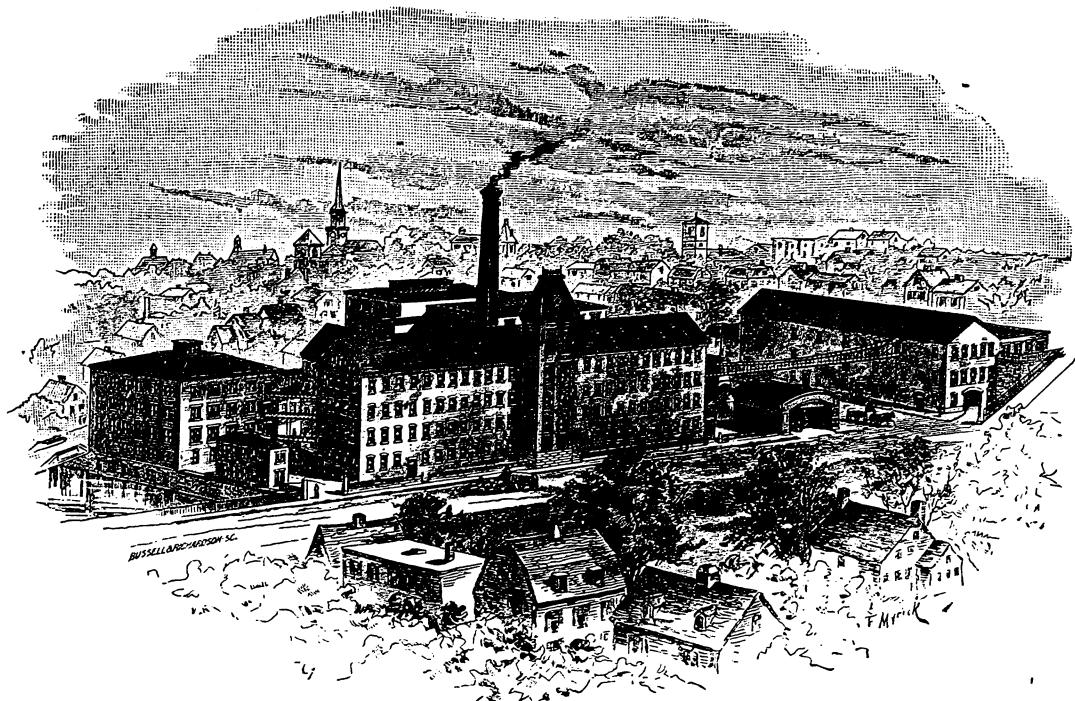
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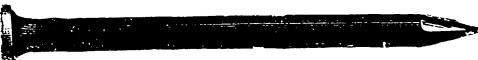
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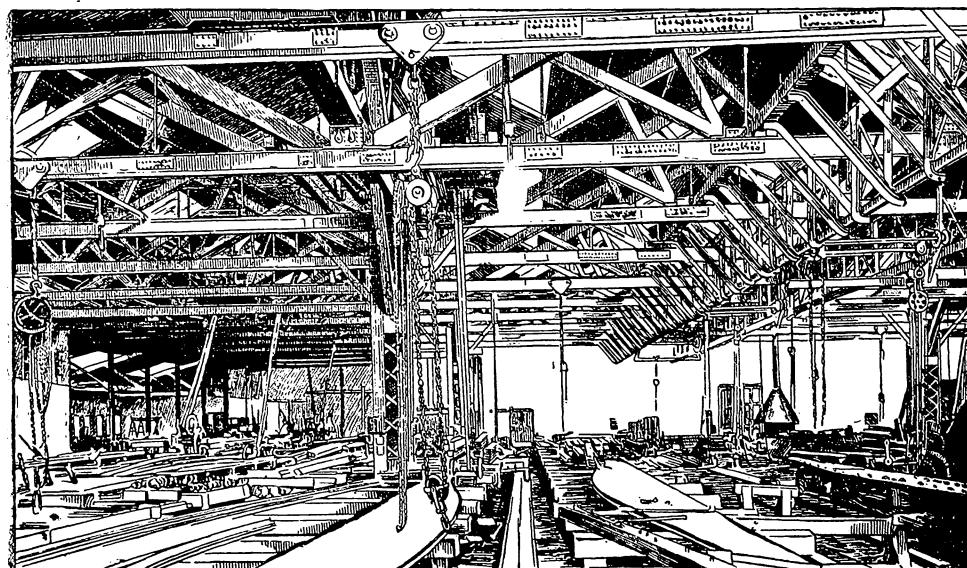
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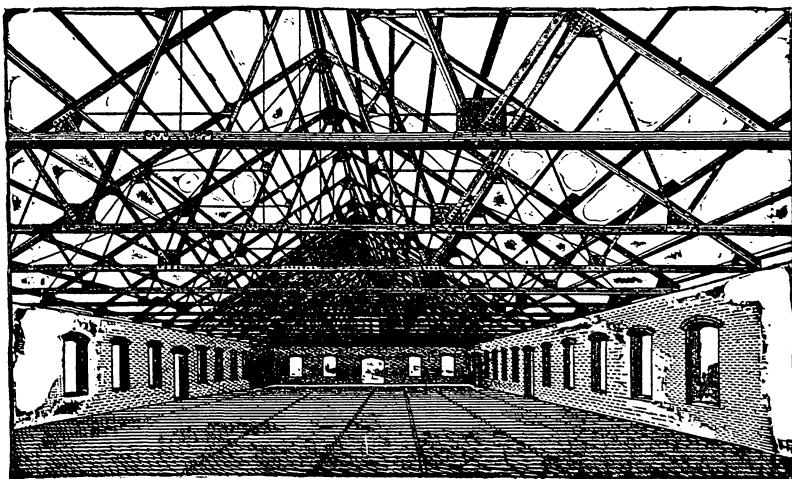
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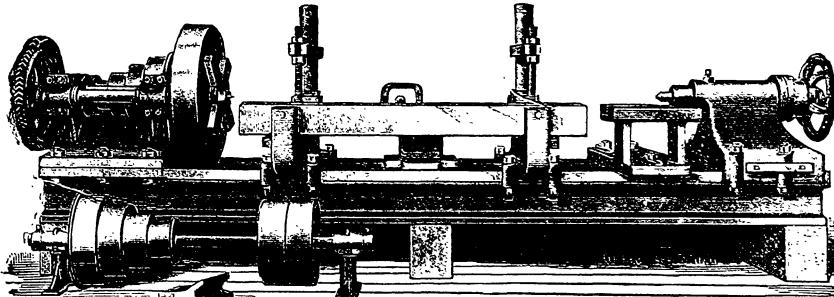
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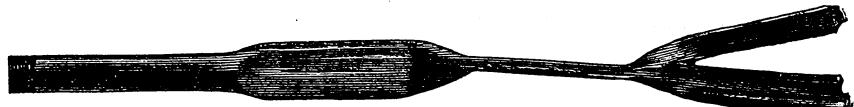
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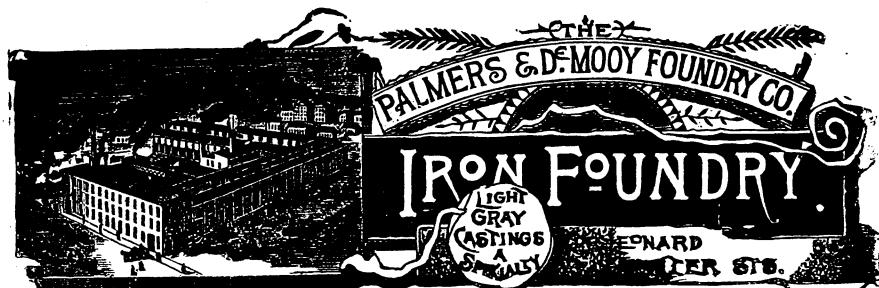
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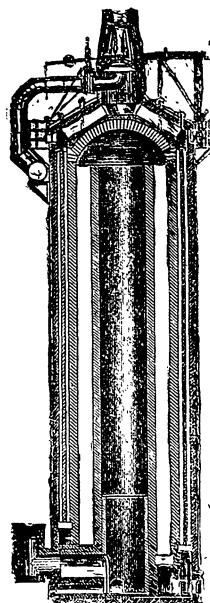
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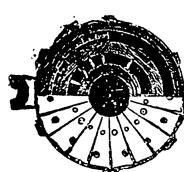
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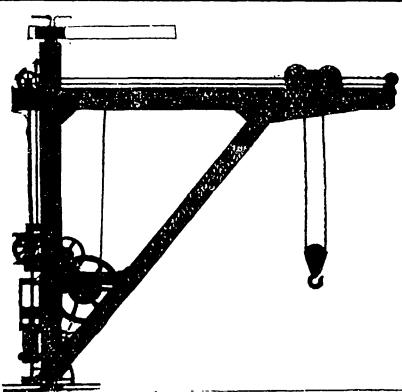
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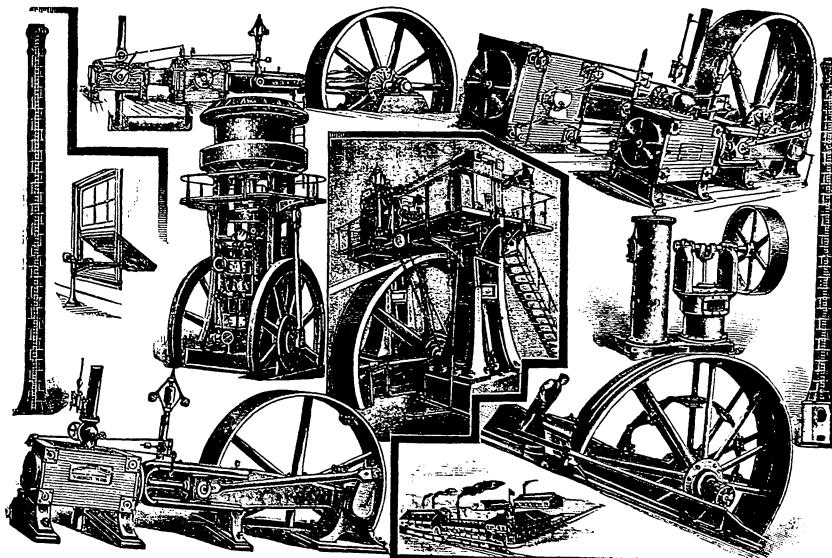
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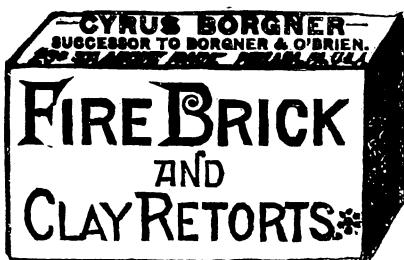
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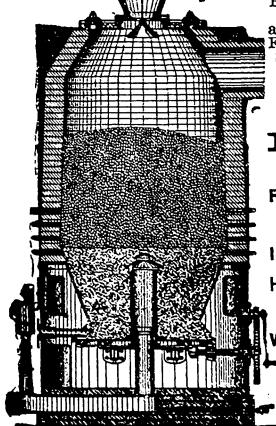


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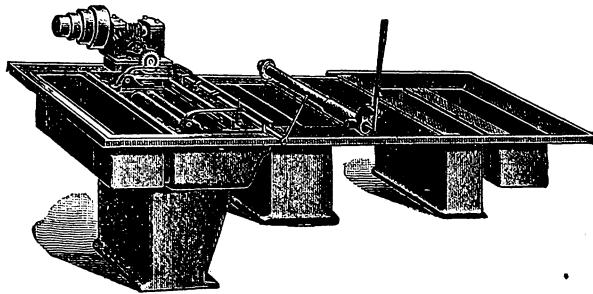
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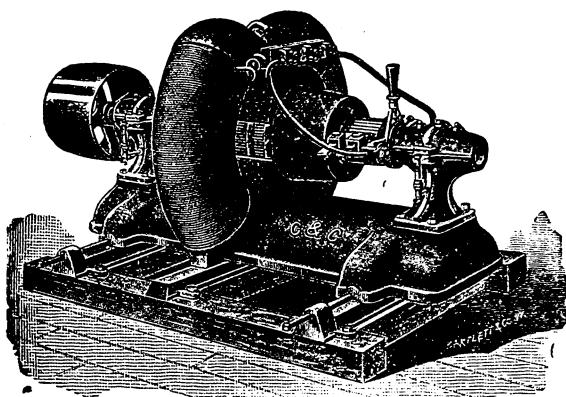
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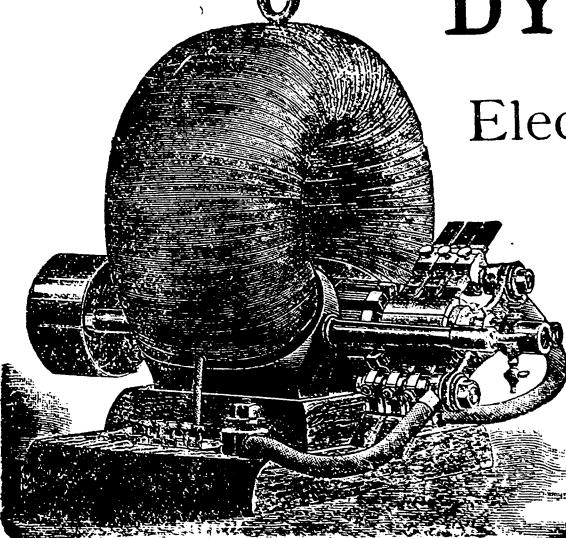
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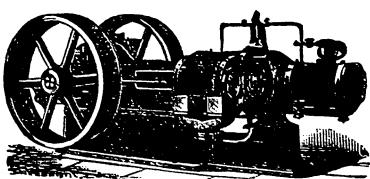
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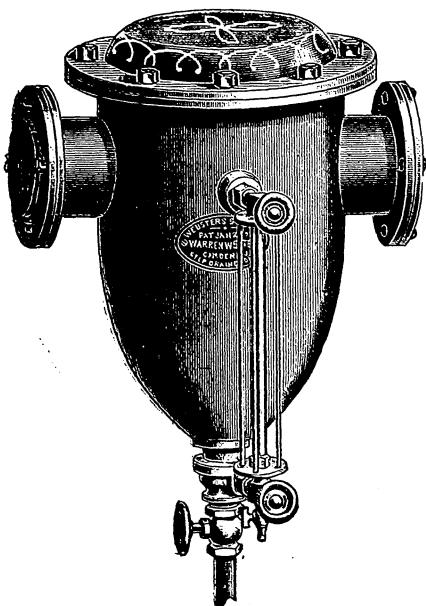
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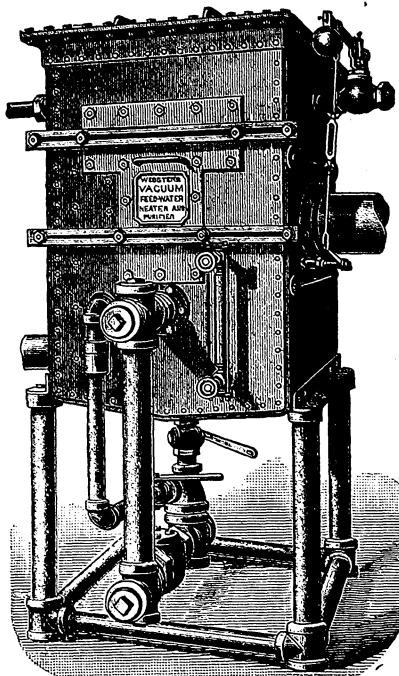
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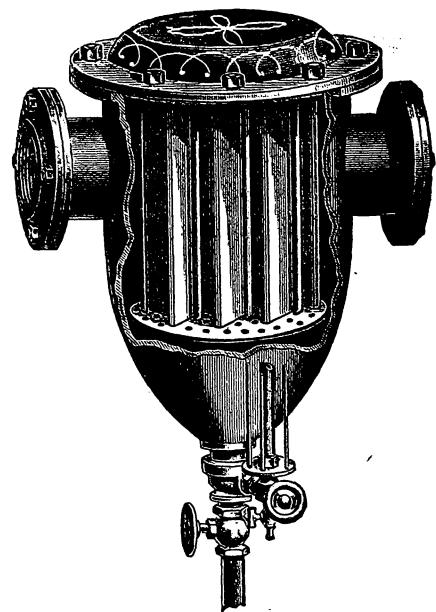
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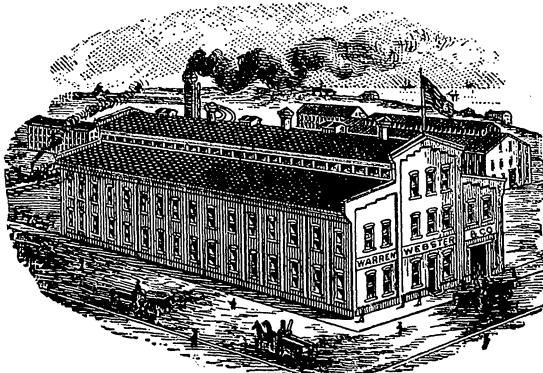
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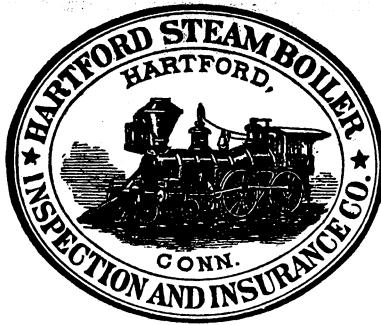
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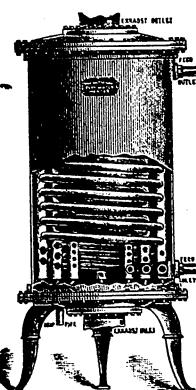
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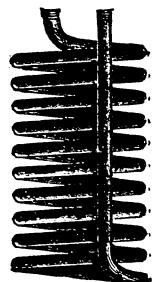
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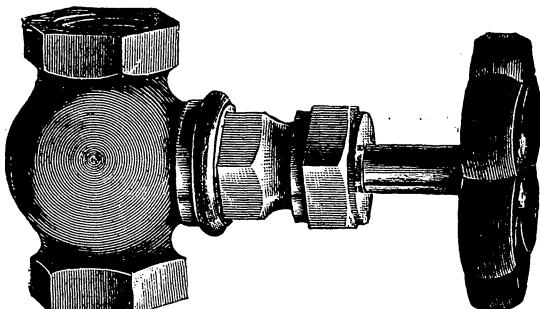
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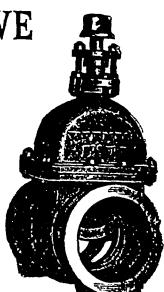
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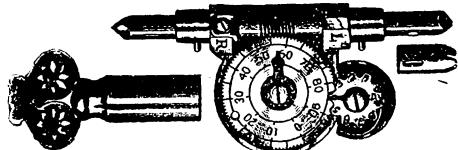
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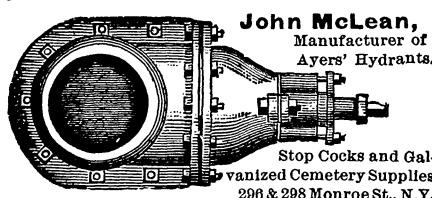
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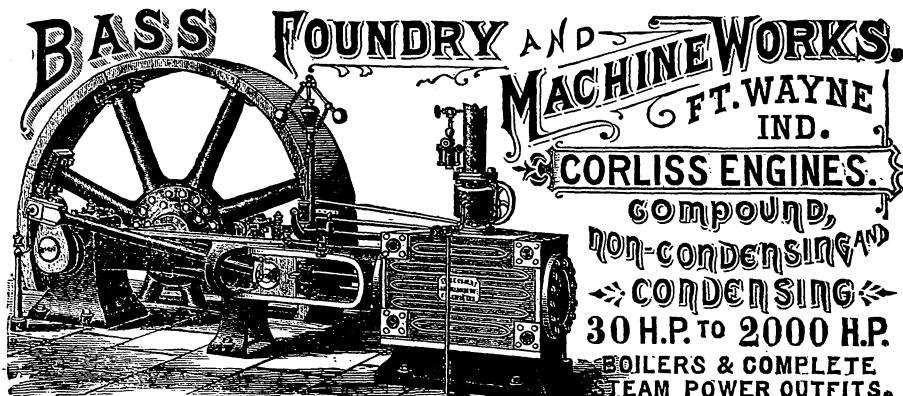


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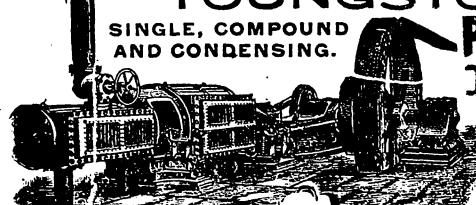


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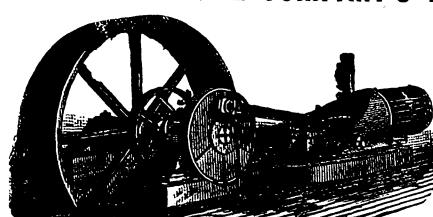
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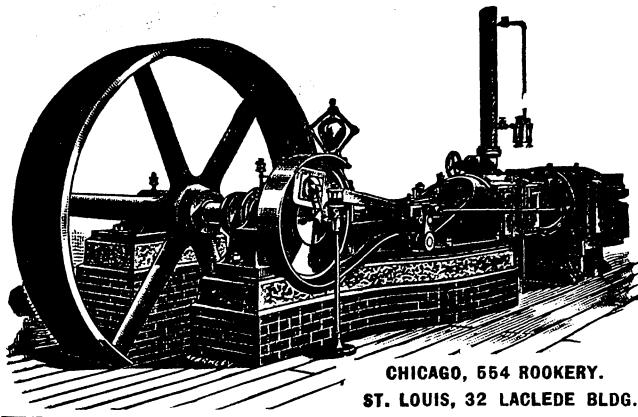
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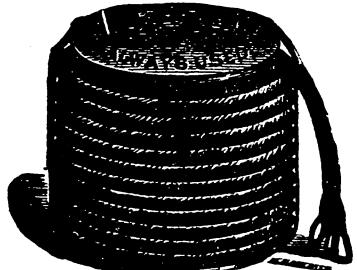
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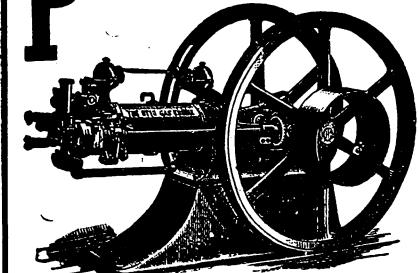
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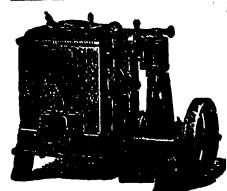
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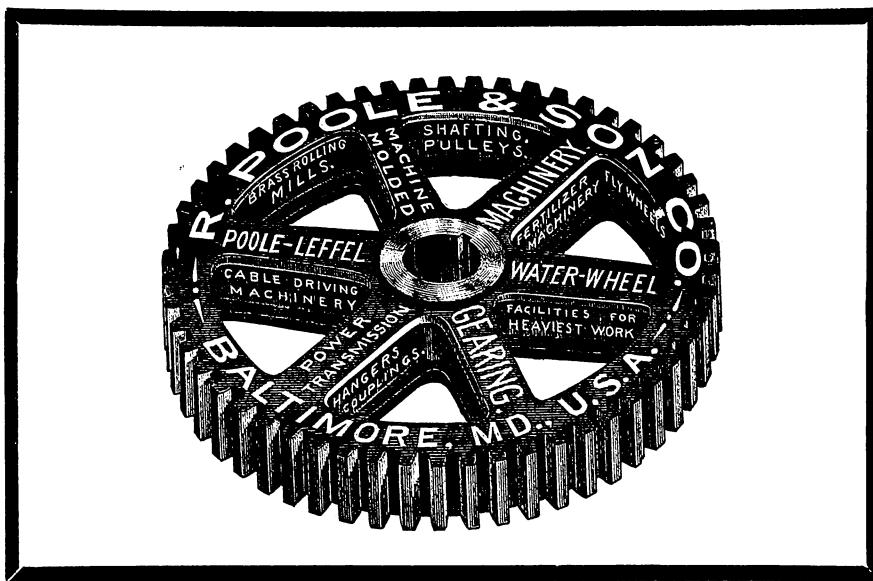
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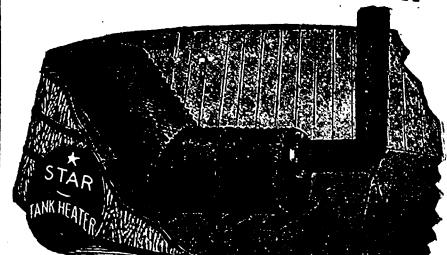
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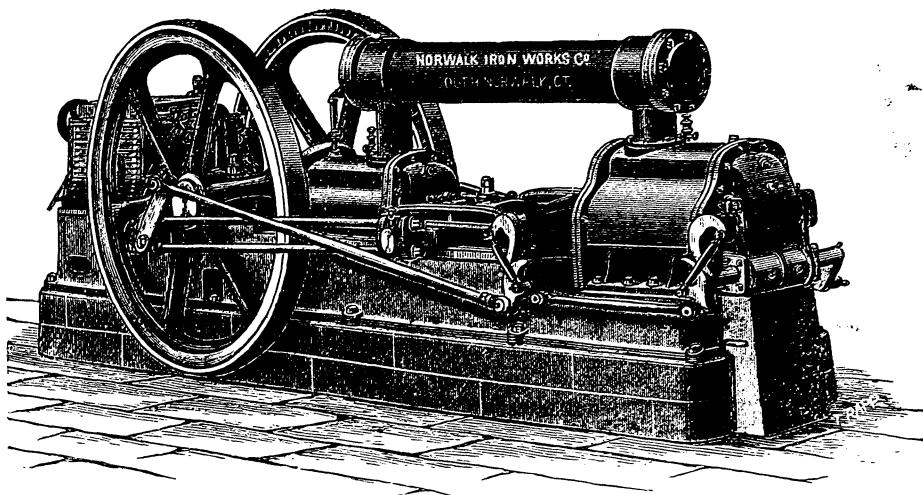
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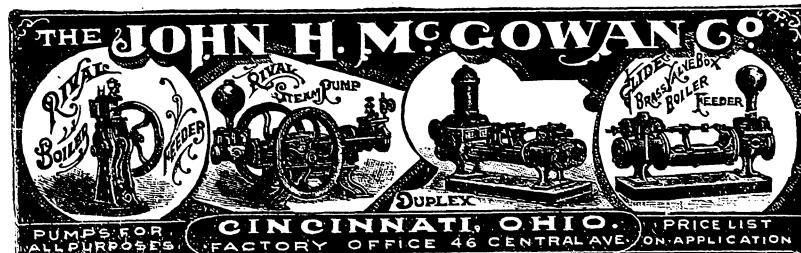
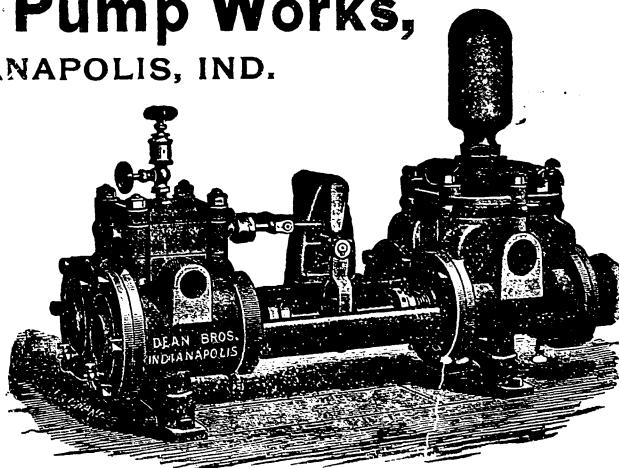
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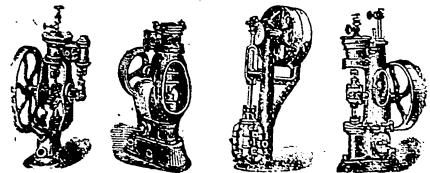
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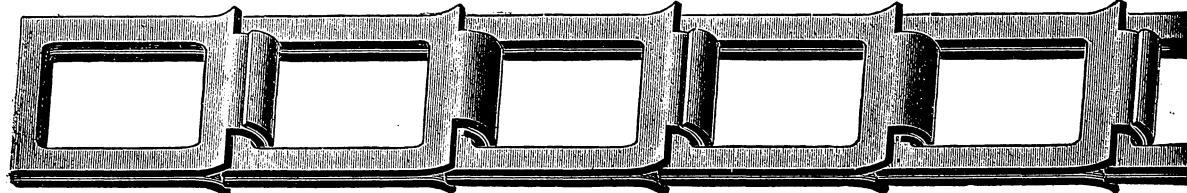
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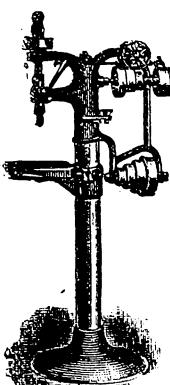
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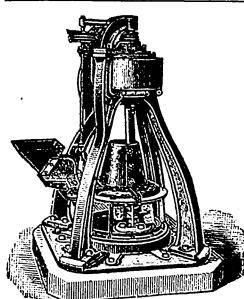
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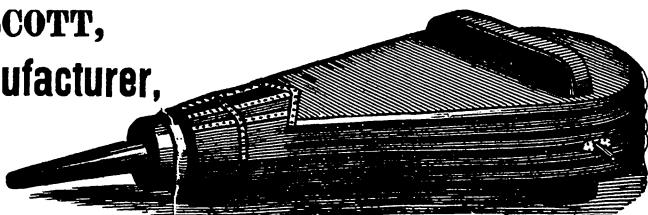
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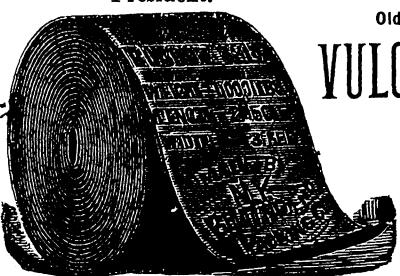
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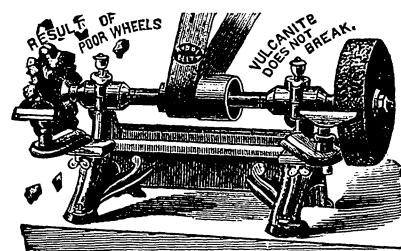
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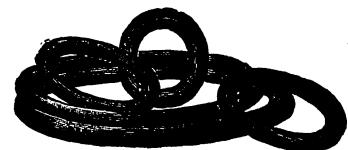
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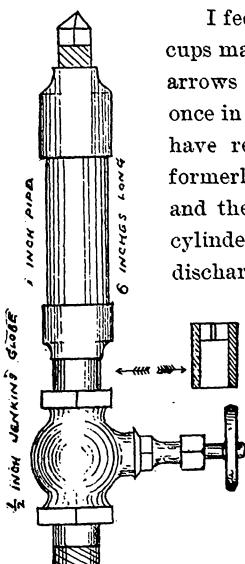
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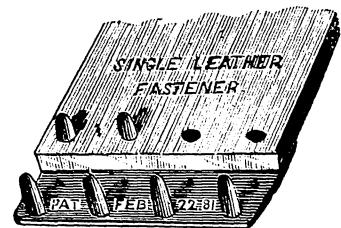


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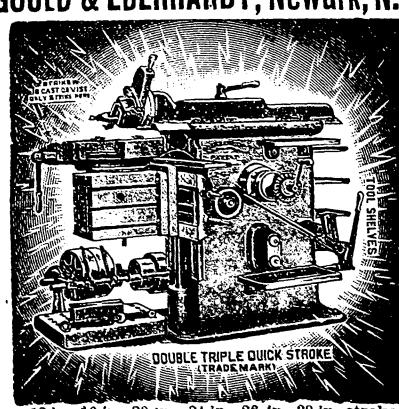
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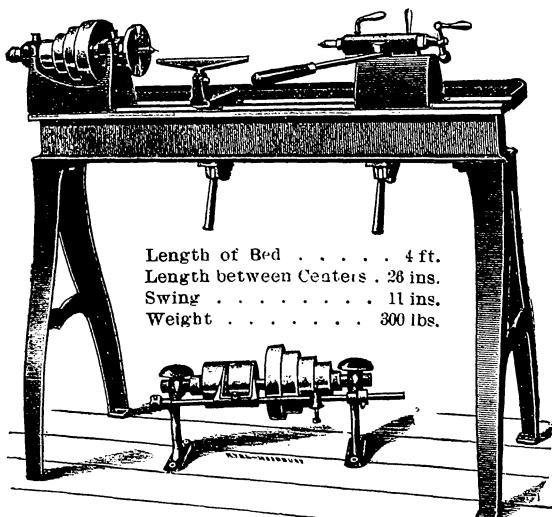
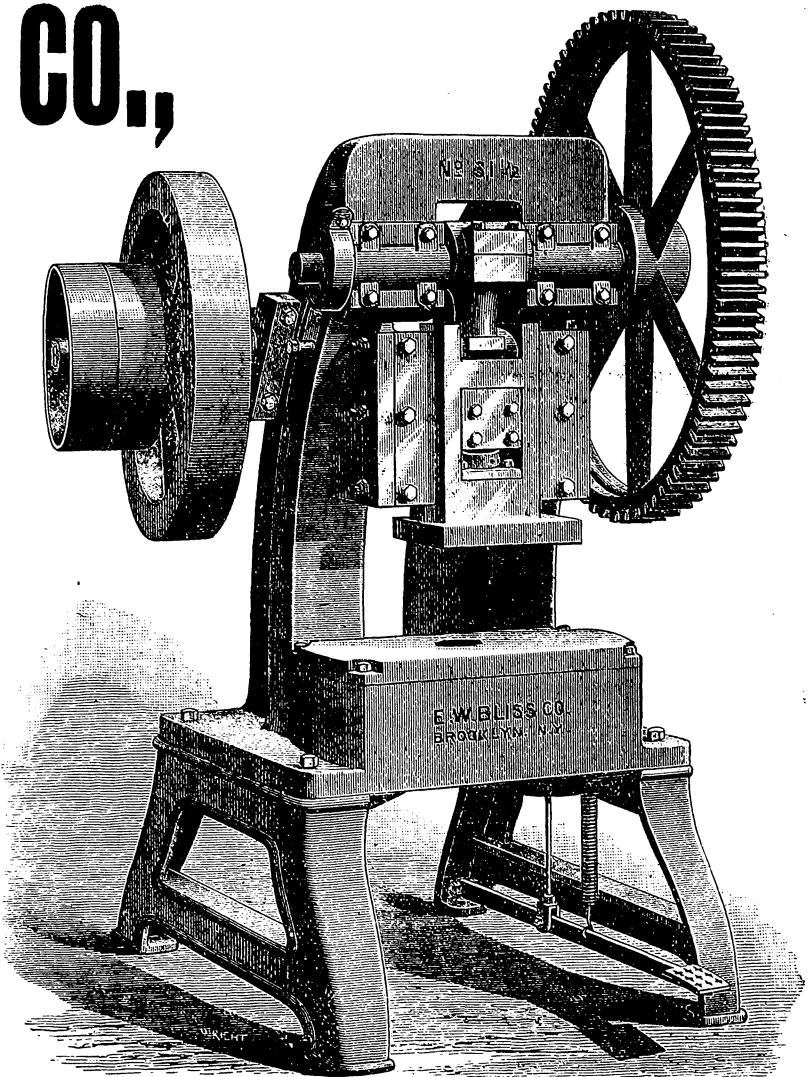
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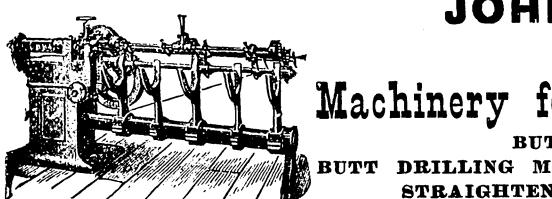
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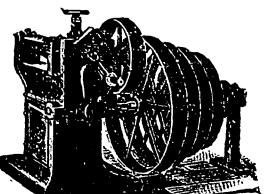
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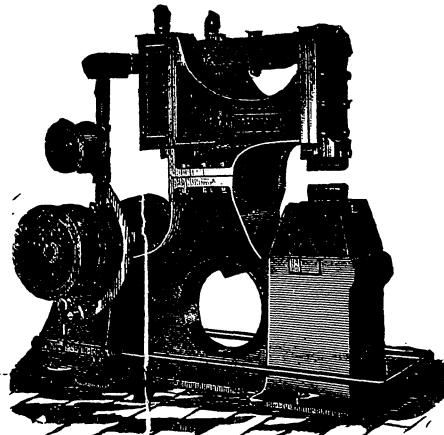
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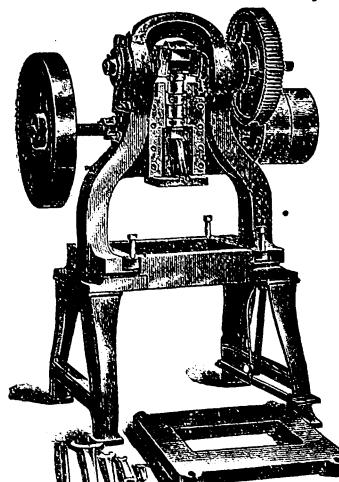


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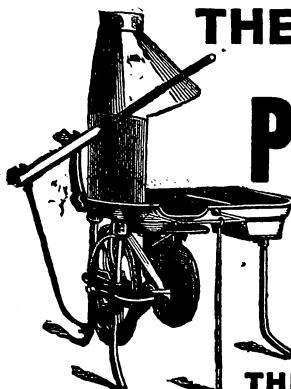
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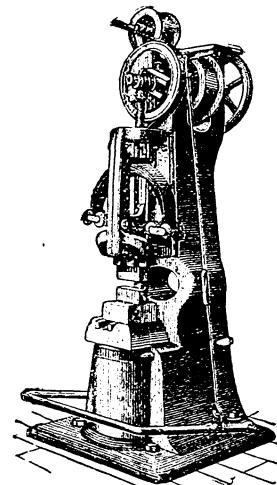
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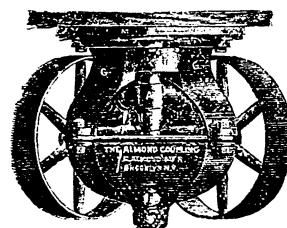
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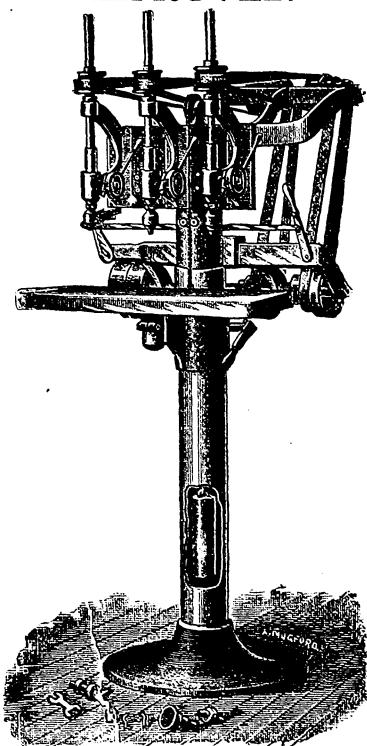
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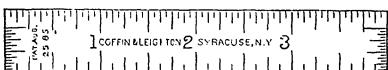
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One, Two and Three Spindles.

Counter-balanced Spindles and Tables. Vertical range of table, 30 inches, and it will swing to right or left.

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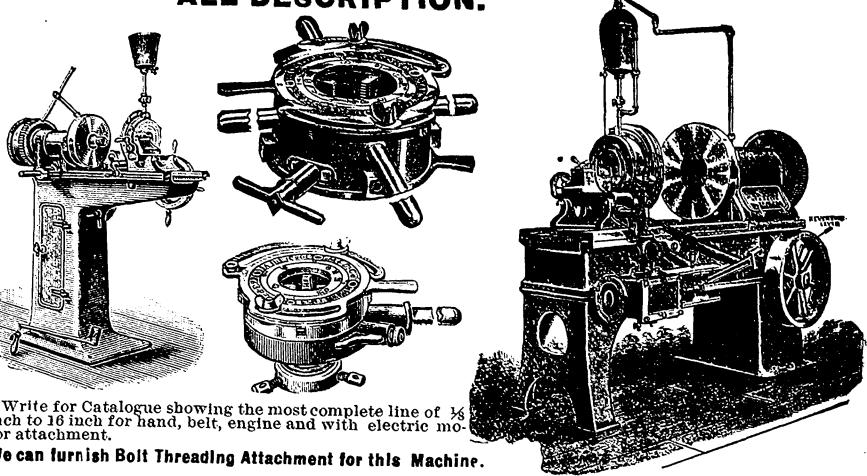
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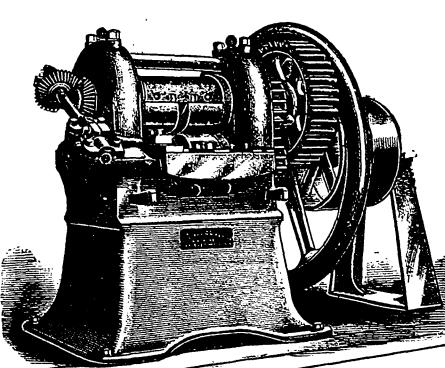


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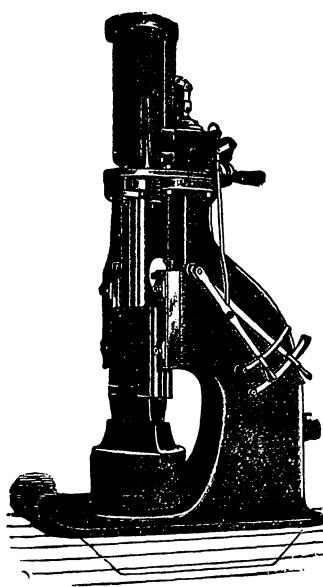
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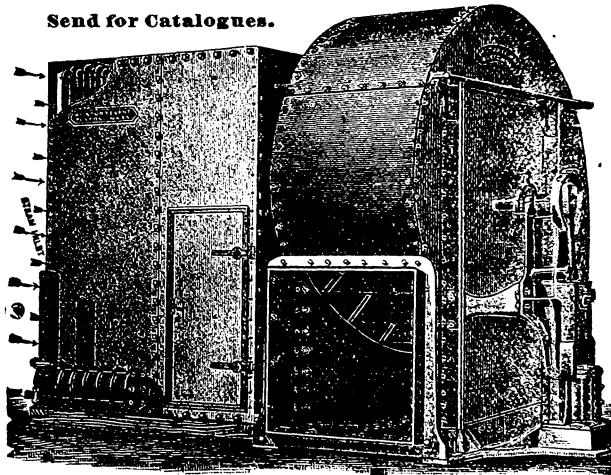
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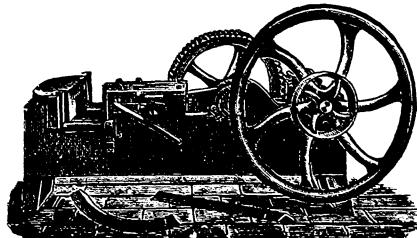
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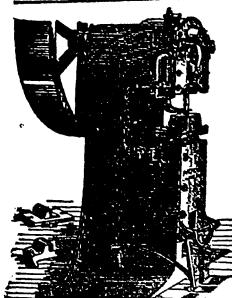
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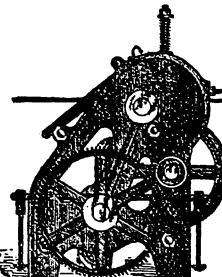
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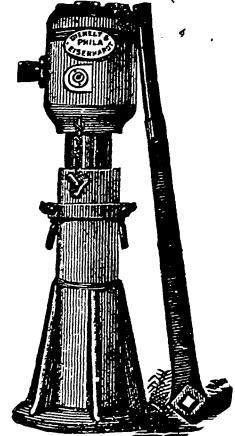
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SUPERIOR TO ANY JACK NOW MADE.

Absolute in its action in any position.
Under complete and instantaneous control.

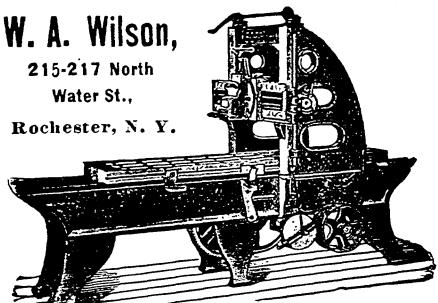


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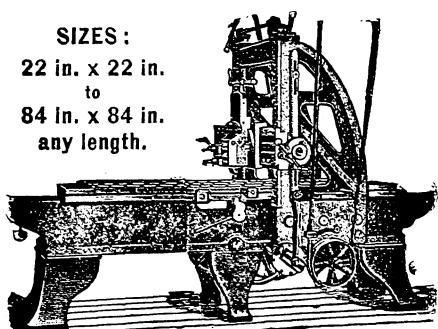
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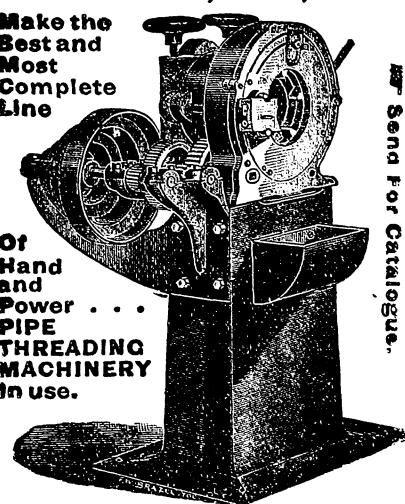
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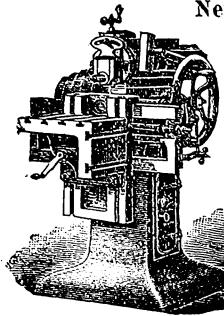
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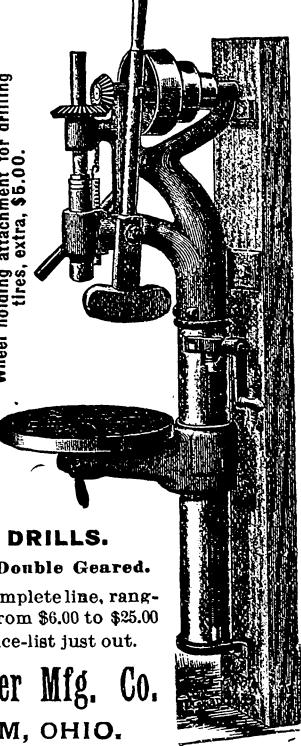
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Post Drill.

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Has CUT GEAR, and is a thoroughly first-class tool in all respects. Dia. Column, $\frac{4}{5}$ in.; Dia. Spindle, 1 $\frac{3}{4}$ in.; and bored No. 2 Morse Taper; Vertical Travel, 6 in.; Drills to centre 18 in. circle.

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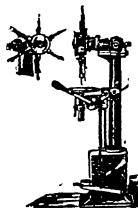
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Suitable for a large variety of work and is operated with ease and rapidity.

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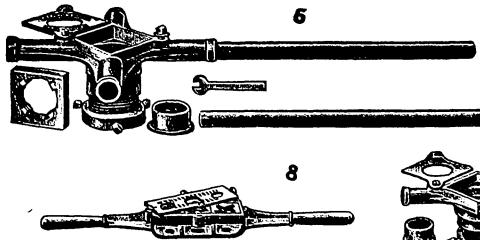
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D. SAUNDERS' SONS.

MANUFACTURERS OF PATENT

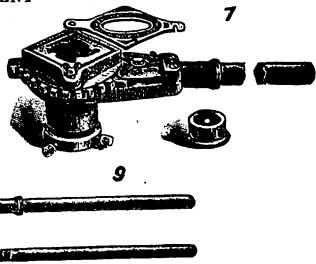
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8



7



STOCKS AND DIES.

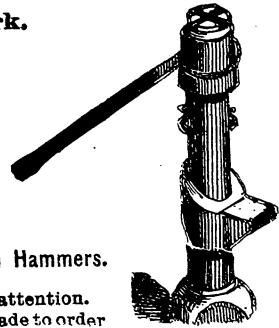
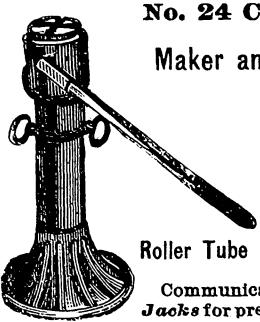
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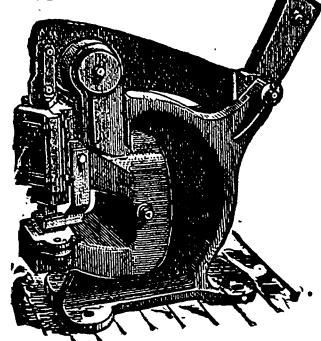
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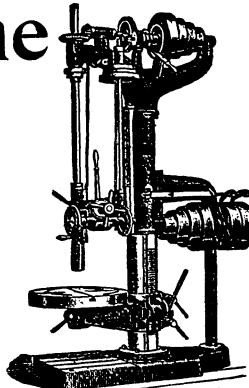
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FOR BOTH DOUBLE AND
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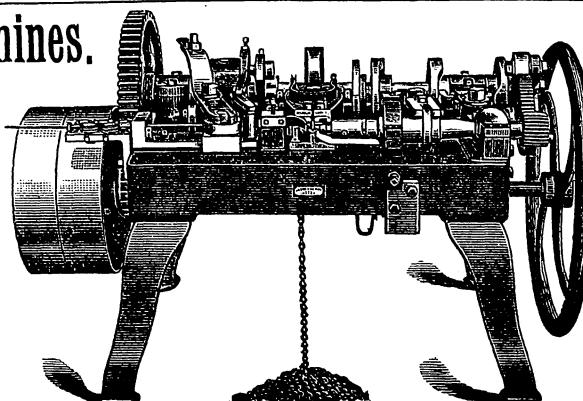
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Send for prices.

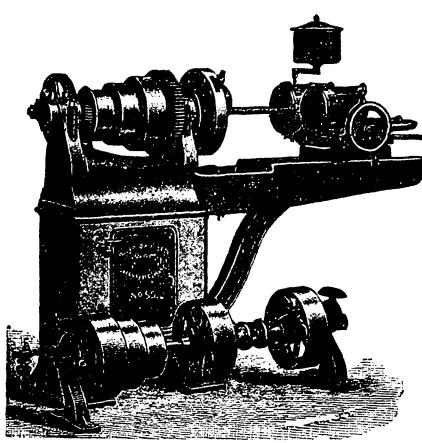
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Two "Points" about it—only 2 (There are plenty more, but we only mention these two here.)

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The First Cost to you of MAULE'S "SKELETON" PIPE DIE is less than that of any other Pipe-THREADING Die—and

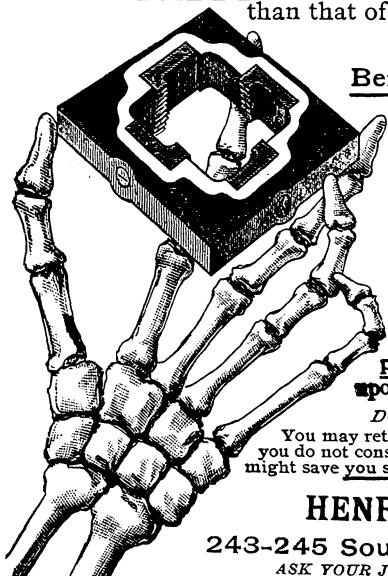
2

Before it becomes dull from use it will cut as many perfect threads as the best solid die extant, and when it is dull, you don't throw it away and buy a new one—Oh, no! You simply sharpen the cutters on a common grindstone, and so make it practically as good as it was at first, and this sharpening process may be repeated a number of times.

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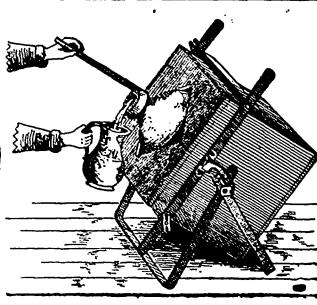
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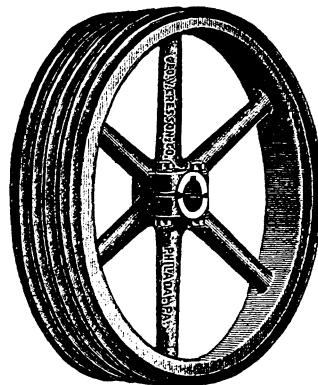
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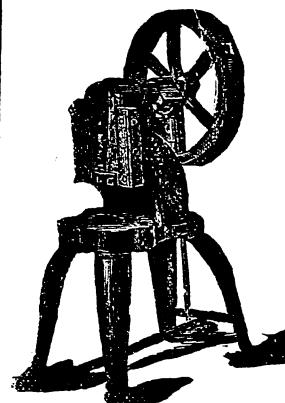
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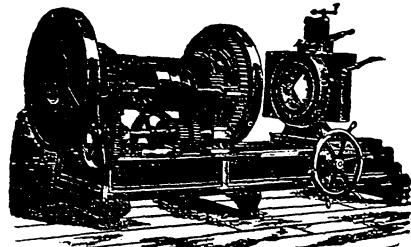
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All Diameters and Number of Grooves, for Manilla, Hemp, Cotton, or Leather Ropes.



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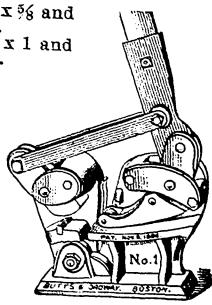
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Every machine is
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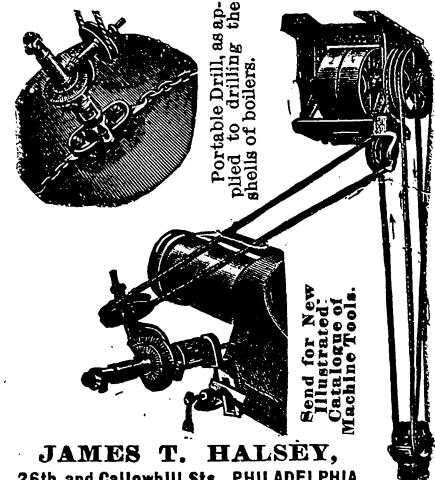


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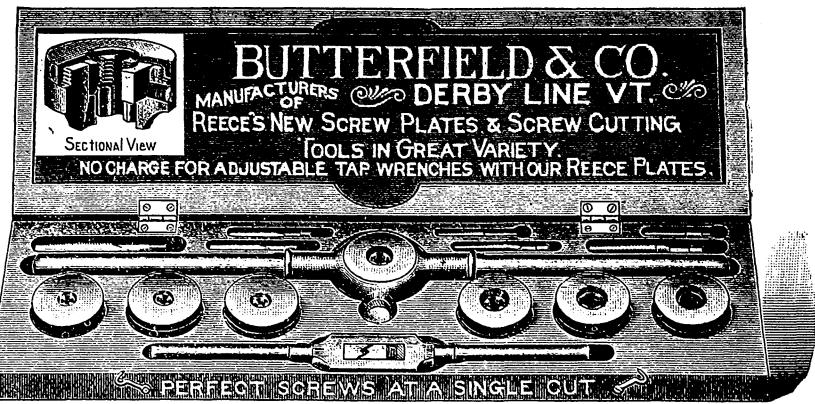
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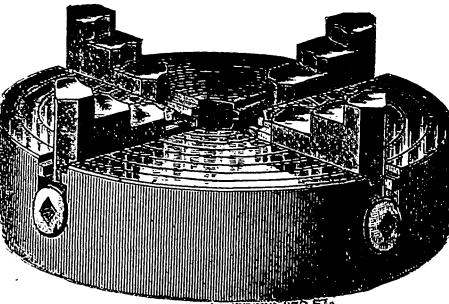
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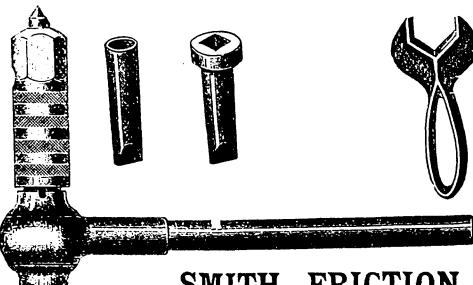
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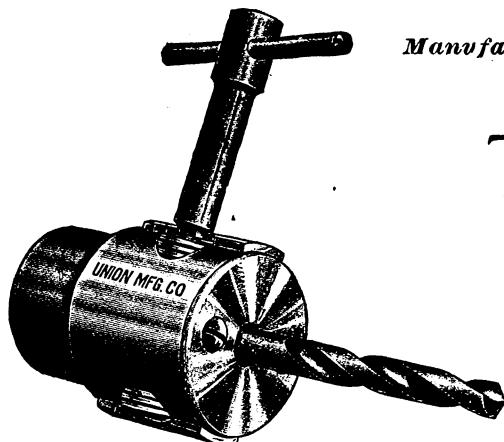
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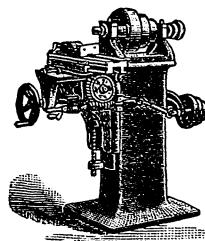
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NUMBER.	DIAMETER.	HOLDING.	LIST.
000	1 $\frac{1}{4}$ inches.	0 to $\frac{1}{2}$ inch.	\$7.00
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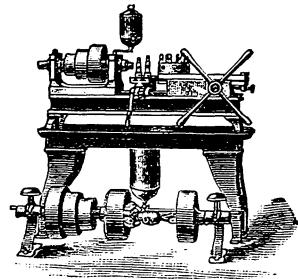
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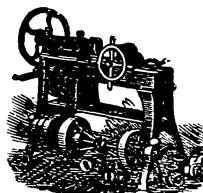


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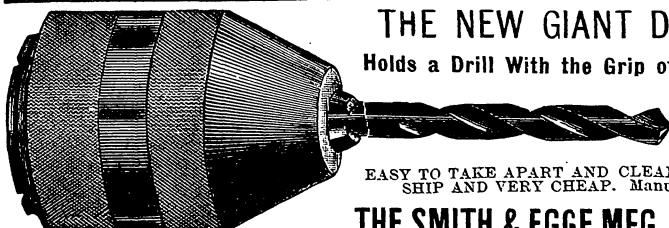
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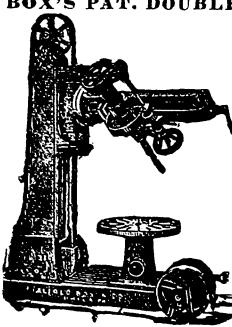
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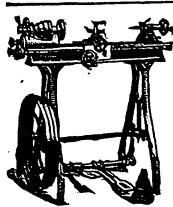
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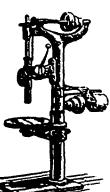
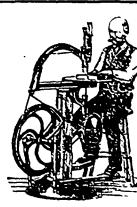


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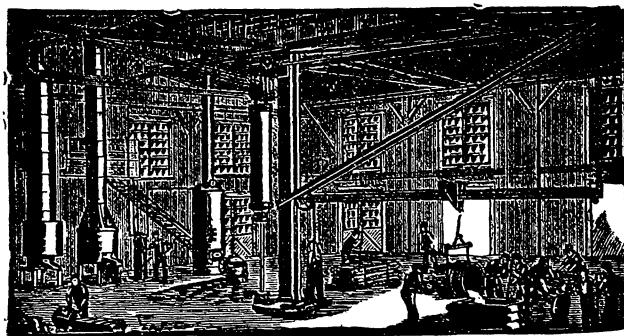
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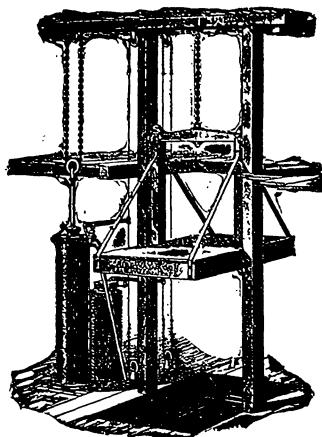
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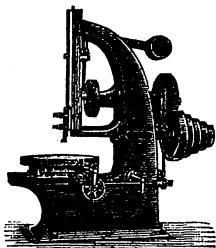
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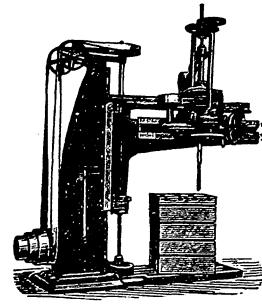
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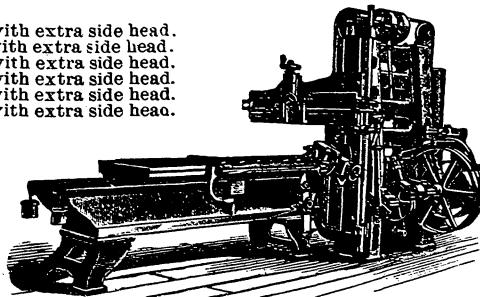
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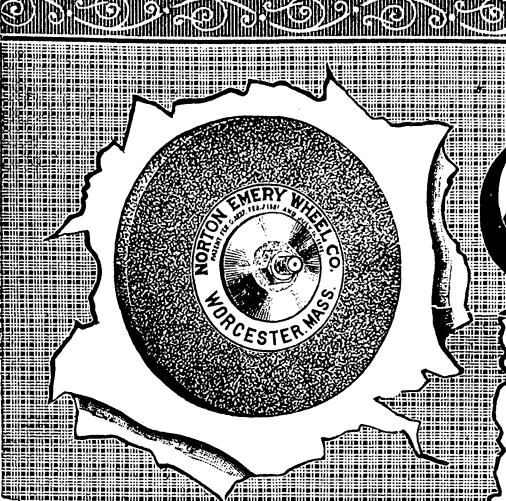
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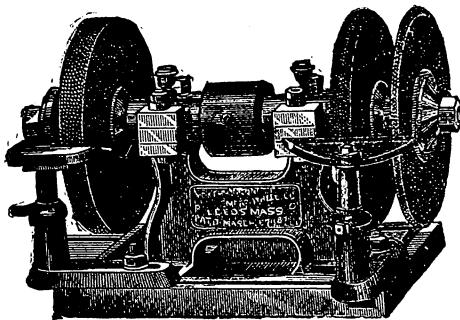
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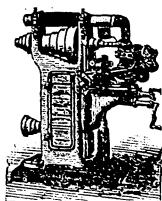
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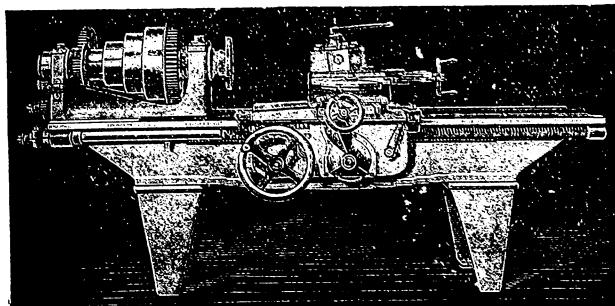
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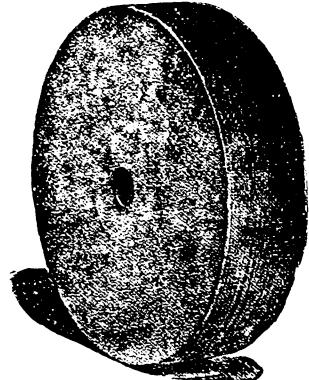
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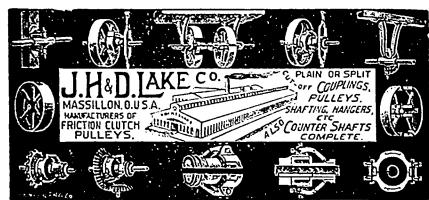
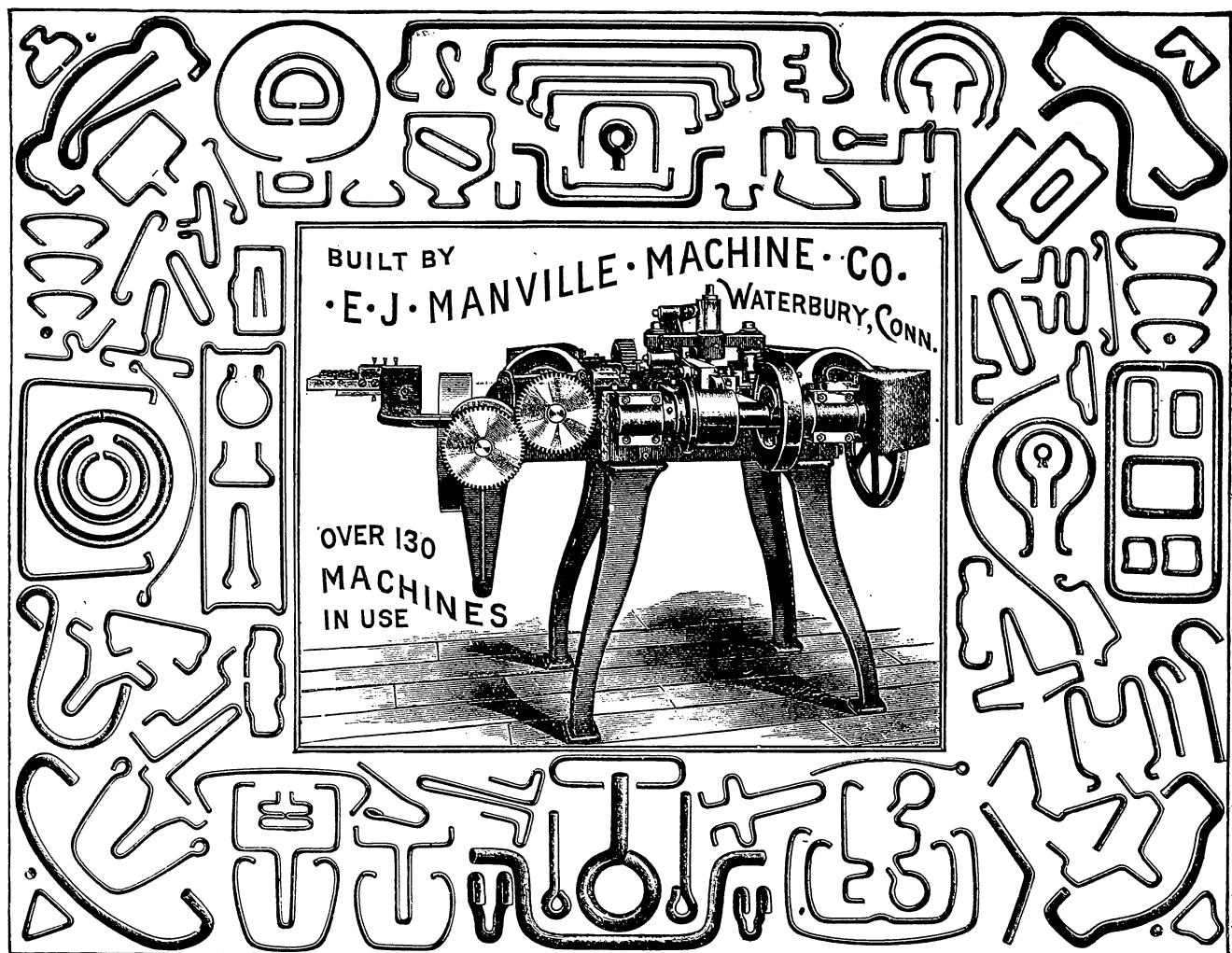
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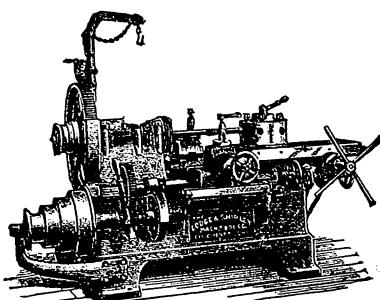
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500 tons Relaying Steel Street Rails, side bearing, 35 to 47 lb. sections. Also 65-lb. Steel T's.

WM. H. PERRY & CO., Providence, R. I.

FOR SALE.

2 Stokes & Parrish 7 in. x 9 in. Hoisting Engines.

3 No. 7 Knowles Pumps.

1 Worthington Duplex Pump, 10 x 6 x 10 in.

Lot 30 and 36 in. Plain Cylinder Boilers.

Lot 1 Beams, Stacks, &c.

At Merion Furnaces, West Conshohocken, Pa.

Apply for particulars to

POULTERER & COMPANY,

No. 26 Bullitt Building, Philadelphia, Pa.

FOR SALE.

1 Engine Lathe, 24 in. swing x 25 ft. bed. Modern. First-class condition.

1 Lincoln Miller. Good order.

1 3-in. Cutting-off Machine. Nearly new.

1 No. 1, No. 2 and No. 6 Root's Blower.

Prices very reasonable.

COOKE & CO.,

163 and 165 Washington St., New York.

FOR SALE.

Hand-power traveling crane, 16-foot span, with racking gear and brake. Low price.

Terms cash. THE SARGENT CO., Chicago, Ill.

WANTED.

A second-hand 8 in. Guide Train; must be in first-class condition. Address, giving full description, price, etc., COMPANIA INDUSTRIAL MEXICANA, Chihuahua, Mexico.

Great Bargains.

Must be Sold and
Removed.

16 in. x 30 in. Horizontal Engine.
18 in. x 36 in. Horizontal Engine.
24 in. x 36 in. Horizontal Engine.
19½ in. x 48 in. Beam Engine, with
Knowles Condenser.

Write us for what you want.

LOVEGROVE & CO.,

Third and Quarry Sts., Philadelphia, Pa.

SECOND-HAND MACHINERY.

One American Tool Co.'s No. 2 Cabinet Turret Lathe, with slide rest; in fine order.
One Pratt & Whitney 36-in. Gap Chucking Lathe.
One Pratt & Whitney No. 3 Lincoln Milling Machine.
One Iron Planer, 52 in. wide, 44 in. high, 12 ft. long, with two heads.
One Springfield Universal Grinding Machine No. 3, swing 18½ in. over the ways and take 6 ft. between centers. Has been used but a very few times and is practically new.
One L. W. Pond Gear Cutter, to cut gears 36 in. diameter, 5 in. face, also arranged for cutting beveled gears.

HILL, CLARKE & CO.,
156 Oliver St., Boston, Mass.
12 and 14 South Canal St., Chicago, Ill.

WE ARE OFFERING

BARCAINS

from the equipment of the United Electric Traction Company's Works of Marion, N. J., comprising:

Engine Lathes, from 14 in. to 48 in. swing. Hand Lathes, from 10 in. to 20 in. swing. Planers, from 24 in. x 5 ft. to 42 in. x 12 ft. Shapers, from 15 in. to 20 in. stroke. Drill Presses, all sizes up to 24 in. swing. Milling Machines, Plain and Universal. Brown & Sharpe Screw Machines. 1 Large Newton Slotting Machine. 1 Large Pond Mach. Tool Co.'s Radial Drill Press. 2 Gould & Eberhardt Automatic Gear Cutters, 36 in., 48 in. and 60 in. 1 Betts Machine Co. Large Horizontal Boring Mill. 2 Large Bliss Power Presses. 1 10 H.-P. Baxter Engine, with 15 H.-P. Boiler, complete. As good as new. Also Tool Grinders, Die Sinkers, Tapping Machines, Bolt Cutters and Large Patters and Blacksmith Shop Equipments.

These tools are in good order and of the very best made in this country. They will be sold at remarkably low prices.

Call at our salesroom and inspect them, or write for complete descriptive circular and price-list.

THE GARVIN MACHINE CO.,
Laight and Canal Sts., New York.

SOME BARCAINS HERE.

1 Hendey Shaper, 16 in. stroke, imp. vise, new. 1 14 x 6 Screw Cutting Engine Lathe; new. 1 5 in. hole in Turret Screw Machine and Counter, \$25. 2½ Hendey Cutting-off Machine. New. 1 3-Spindle Garvin Drill Press, used 1 month. 100 H.-P. Woodbury Engine. 2d-hand. Good order. 2 50 H.-P. Woodbury Boilers. Good order. 2 75 H.-P. Woodbury Boilers. Good order. 1 20 H.-P. Woodbury Engine. 2d-hand. Also variety of Engines, Boiler Pumps, &c. And other machinery, new and second hand. Write for prices. **Mechanists' Supply Company,** 30, 41 and 43 Central Ave., Rochester, N. Y.

WANTED.

Second-hand Power Press, size Bliss No. 20 or 21. Price must be low for cash. **ROBLEY & RUNDAGE,** 142 Chambers St., New York.

Boilers A N D Engines

1 100 H.-P. Horizontal Tubular Boiler.
2 65 H.-P. Horizontal Tubular Boilers.
2 125 H.-P. Portable Boilers.
1 90 H.-P. Portable Boiler.
1 60 H.-P. Portable Boiler.
1 75 H.-P. Harrison Boiler.
1 50 H.-P. Galloway Boiler.
2 250 H.-P. Hazelton Boilers.
1 75 H.-P. 15½ in. x 24 in. Horizontal Engine.
1 50 H.-P. 12 in. x 24 in. Wright Engine.
1 20 H.-P. 9 in. x 12 in. Erie Engine.
And many others.

THOS. P. CONARD,
206 Walnut Place, Philadelphia.

FOR SALE.

1 140 H.-P. Hor. Tub. Boiler. Al. **BERRYMAN HEATER,** 44 in. dia., 10 ft. high.
36 x 48 Corliss Engine. Lightburn Surface Condenser, 1100 sq. ft. cooling surface.
12 in. Centrifugal Pump, 60 ft. hose.
MARVIN BRIGGS, 12 Broadway, N. Y.

FOR SALE.

ELECTRIC LIGHT PLANT (used 6 months).
1000 light Mather Dynamo.
125 H.-P. Dick & Church Compound Engine.
2 75 H.-P. Steel Boilers.

MARVIN BRIGGS, 12 Broadway, N. Y.

SECOND-HAND MACHINERY.

2 11 in. x 5 ft. Reed Engine Lathes.
2 11 in. x 5 ft. Prentiss Lathes.
2 12 in. x 5 ft. Young Speed Lathes.
2 13 in. x 5 ft. Ames special feature Lathes.
2 15 in. x 6 ft. Reed Engine Lathes.
1 15 in. x 8 ft. Young Lathe.
1 16 in. x 6 ft. Young Lathe.
1 16 in. x 6 ft. Perkins Lathe.
2 18 in. x 6 ft. Blasdell Lathes.
1 18 in. x 6 ft. Flather Lathe.
1 18 in. x 8 ft. New Haven Lathe.
1 18 in. x 8 ft. Dustin Lathe.
2 20 in. x 6 ft. Bullard Lathes.
1 20 in. x 10 ft. Dustin Lathe.
2 20 in. x 8 ft. Bullard.
1 20 in. x 10 ft. Bullard.
2 20 in. x 13 ft. New Haven Lathe.
1 20 in. x 13 ft. Dexter Pattern Lathe.
1 20 in. x 13 ft. Bullard Turret Lathe.
2 Brainard No. 7 Overhanging Arm Plain Millers
2 Brainard No. 7 Lincoln Plain Millers.
1 B. & S. No. 1 Universal
1 Brainard Heavy No. 6 Lincoln Pattern Miller.
1 Garvin No. 2 Miller and Screw Slotter.
1 No. 3 Garvin Plain Miller.
1 38 x 18 ft. N. Y. S. E. Lathe. Also large stock of New Tools.

NILES TOOL WORKS CO.
136 & 138 Liberty St., N. Y. City.

MACHINERY, TOOLS, &c.

IN STOCK, LARGE LINE OF NEW AND SECOND-HAND ENGINES, BOILERS AND MACHINIST'S TOOLS FOR SALE OR EXCHANGE. Below are some special bargains: 60 H.-P. Atlas Automatic engine. 20 H.-P. to 60 H.-P. plain slide valve horizontal engines. 10 H.-P. to 50 H.-P. vertical engines. Power Shears, 1 1/2 in. Iron, 3½ in. Gap. 2 1/2 in. Pratt & Whitney cut-off machine. 4 H.-P. and 10 H.-P. hoisting engines with boilers. 1 2, 4 and 6 H.-P. yacht engines. 4 H.-P. and 7 H.-P. gas engines. 4 50 H.-P. portable boilers. 10 H.-P. to 100 H.-P. horizontal and vertical boilers. 20 screw-cutting lathes of different sizes. Several rod-feed turning lathes. 6 in., 12 in. and 16 in. shapers. 24 in. and 36 in. planers. 44 in. radial drill. 1 1/4 National bolt cutter. No. 3 Fowler press, 2 1/2 in. exhaust heads. 25 lbs. Bradley and 10 lbs. Hotchkiss Hammers.

FRANK TOOMEY,
131 N. Third St., Philadelphia, Pa.

4 3 H.-P. Vertical High Pressure Engines.
2 5 H.-P. " "
3 6 x 10 Horizontal Engines.
2 8 x 12 " "
2 10 x 14 " "
8 5 H.-P. Gas Engines.
5 10 H.-P. " "
1 8 x 12 D. C. Hoisting Engine.
3 Rock Crushers.

H. H. MANSFIELD,
126 Liberty St., New York

CORLISS

and other Automatic Engines, Slide Valve Engines
Boilers, Steam Pumps, Tanks, &c., &c.

CORLISS, 10 x 20; 10 x 24; 12 x 36; 14 x 30, 16 x 42; 28 x 36; 22 x 48; 26 x 48; 28 x 60; 30 x 60; 30 x 72; Porter-Allen, 14 x 30; Brown, 16 x 42.

HIGH SPEED AUTOMATIC, 12½ x 15; 14 x 16; 12 x 18; 11 x 20; 10½ x 12; 9½ x 12.

HORIZONTAL SLIDE VALVE, 28 x 32; 18 x 36; 18 x 48; 16 x 36; 14 x 24; 13 x 24; 12 x 18; 10 x 14; and others.

VERTICAL SLIDE VALVE, 28 x 30; 20 x 24; 13 x 16; 18 x 12; 10 x 10; 9 x 9; 8 x 10; 7 x 9; 7 x 7; 6 x 6.

ASSORTMENT OF BOILERS, Horizontal, 6 x 16; 5½ x 16; 5 x 16; 4 x 14; 4½ x 12, and others.

LOCOMOTIVE BOILERS, 15, 30, 45, 50, 60, 70, 100 and 150 H.-P.

ASSORTMENT OF STEAM PUMPS, 1000 g. Duplex Fire Pump also Brennan Crusher, Boggard Mill, Rock Drill, Burr Stone Mill, Fan Blowers, Platform Scales, Wood Planer, Rendering Tank, Open Tanks, Hoisters, Berryman Heaters, 800-ton Hydraulic Press, Boiler Rolls. Also some Large Steel Boilers, new, below market price. Send for catalogue.

GEO. M. CLAPP,
74 Cortlandt St., New York.

ROLLING MILL OUTFIT.

For Sale, the Following Machinery and Tools, in good order, for immediate or future delivery.

For further particulars apply to the undersigned:

1 Horizontal Low Pressure Engine, 9 in. x 72 in.
2 Fly Wheels, 24 ft. diameter, each weighing 53 tons.
1 Vertical Engine, 7 in. x 16 in.
2 Horizontal Engines, 14 in. x 24 in.
2 12 ft. 30 in. train, complete.
1 12 ft. 30 in. train, complete.
The above trains will roll 90 in. plates; also a lot of extra rails, all made by Garrison & Co.
1 Roll Turning Lathe made by Garrison, will take in 12 ft. roll and turn up to 40 in.
1 Guillotine Shear, Engine attached, made by Morgan, Williams & Co., knife 104 in. long, will cut 1 inch steel plates.
2 Plate Straightening Machines.
1 Adams' Plate Shear, 48 in. throat, 26 in. knife, will cut up to ¾ in. Plate.
2 Heavy Upright Plate Shears, 12 in. throat, 22 in. knife, will cut up to 1¼ in. Plate.
2 Bar Shears.
1 Rotary Shear.
1 Fairbank's Testing Machine, with counter-shaft, or can be worked by hand power.
4 Large Iron Cranes, improved pattern, each about 25 tons capacity.
8 Small Cranes, also charging Cranes and Portable Cranes on car for handling Ingots.
1 Blake Pump, 14 in. steam, 16 in. water.
2 Worthington Duplex Pumps.
1 Blake Pump, No. 7.
1 Sturtevant Blower, No. 12.
3 Tubular Boilers, with fronts and Attachments.
1 No. 7 Brush Light Machine, 15 Double Lamps. Also Furnaces, Cylinder and Flue Boilers, Buggies, Shafting, Pipe Stacks, etc., etc., and other tools, etc., belonging to above plant.

MATTHEW GILL, Jr.,
308 Walnut St., Philadelphia, Pa.

!!! FOR SALE !!!

BAKER BLOWERS, Nos. 1, 4½, 5, 6 and 7. **ROOT BLOWERS**, Nos. 1, 2, 3, 4, 5, 6, 8 and 7. Sturtevant Blowers, Nos. 4, 5, 6, 8 and 7. **Corliss Band Wheel**, 12 ft. x 24 in., in halves. A Variety of Machinery, Such as Boilers, Engines, Pumps, Crushers, &c., very cheap.

Do you want to buy or sell Machinery? If so, write

C. R. BIGELOW, Machinery Expert,
45 Dey St., New York City.

FLY WHEEL.

For quick sale, a perfect 20 ton Fly Wheel, 16 feet diameter, rim 15 in. x 15 in., in 8 sections, made by A. Garrison & Co. Also, 10 in. forged iron shaft for same.

C. W. SCHULTZ & CO.,
308 Walnut St., PHILADELPHIA.

FOR QUICK SALE.

One Otis Steam Shovel in good condition. Two 12 ton 3-ft. Gauge Locomotives. Two Standard Gauge Saddle Tank Locomotives. 20 Dump Cars, 3-ft. Gauge, 3-yd. Capacity, Side Dump. 3000 tons Mill Cinder, &c.

Also Pig Iron, Muck Bars, Bar Iron and Steel Billets, Scrap, &c. We are always in the market to buy and sell Equipment and Scrap.

G. H. SIBELL & CO.,
62 and 64 Michigan Ave., Chicago, Ill.

SALE OF VALUABLE PROPERTY
of the corporation known heretofore as The Albany Stove Company. Whereas, by order of the Supreme Court of the State of New York, granted in the City of Albany, N. Y., on the 10th day of October, 1893, the undersigned, receiver of the assets and effects of the corporation known heretofore as The Albany Stove Company, was directed to offer for sale the following described property, viz.: The real estate and buildings owned by the said corporation "The Albany Stove Company," situated on Tivoli street, in the City of Albany, N. Y., being the same premises used by the said corporation in carrying on its business of manufacturing stoves and iron castings, and is the same real estate conveyed by Eugene Van Rensselaer and others, as executors, etc., to The Capital Co-operative Foundry Company, by deed dated October 16, 1869, recorded in Albany County Clerk's office, December 15, 1889, in Book No. 222 of Deeds, on page 241, and by Van Rensselaer Land Company to Albany Stove Company by deed dated January 10, 1890, recorded January 14, 1890, in Book No. 412 of Deeds, on page 318, together with the machinery, tools and implements used in carrying on the business above referred to.

Now, therefore, in pursuance of said order, the undersigned offers for sale to the highest bidder the property above described.

All bids to be sealed, and must be distinctly marked on the envelope in which they are enclosed, "Bids for property of the Albany Stove Company," and addressed and delivered to the undersigned at No. 82 State street, Albany, New York, on or before the 17th day of November, 1893. The right to reject any and all bids is hereby reserved, and sale can only be completed upon order of the court.

Bids will be opened by the receiver at the office of Francis H. Woods, No. 116 State street, Albany, New York, on Saturday, November 18, 1893, at 10 A.M. Terms, purchase price to be paid within twenty days after notification of acceptance of bid.

Dated October 11, 1893.

JOHN GUTMANN,
Receiver of The Albany Stove Company.

SALE OF VALUABLE PROPERTY
of the corporation known heretofore as The Albany Stove Company. Whereas, by order of the Supreme Court, granted in the city of Albany, N. Y., on the 10th day of October, 1893, the undersigned, receiver of the assets and effects of the corporation known heretofore as The Albany Stove Company, was directed to offer for sale the following described property, viz.: The patterns, shop rights and flasks owned by the said corporation, and being the patterns, shop rights and flasks for the "Home Yale" parlor and range, "Yale" cook, "White Oak," "Art Yale Range," "Rose" range, "Oneida," and for other castings, formerly manufactured by the said corporation, a more particular description of which will be given on application to the undersigned.

Now, therefore, in pursuance of said order, the undersigned offers for sale to the highest bidder the property above described.

All bids to be sealed and must be distinctly marked on the envelope in which they are enclosed, "Bids for property of The Albany Stove Company," and addressed and delivered to the undersigned, at No. 82 State street, Albany, N. Y., on or before the 17th day of November, 1893.

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Terms: Purchase price to be paid within twenty days after notification of acceptance of bid.

Dated October 11th, 1893.

JOHN GUTMANN,
Receiver of The Albany Stove Company.

FOR SALE, CHEAP.

400 tons of 60-pound, 200 tons 52-pound and 400 tons of 30-pound second-hand Steel Rails, suitable for relaying. For prices, etc., address

J. H. RICHARDSON & CO.,
Pittsburgh, Pa.

FOR SALE.

2 Double Deck Boilers about 40 H.-P. each, cheap. Hoisting Engine. Cylinder Boilers for Stacks, 30, 40 and 42 in. diameter. Round and Square Iron Tanks. Book Binding Machinery. Smoke Stacks, light and heavy, all sizes. Large lot Cast and Wrought Scrap Iron on hand. Also Dealers in Metals.

BUSSENIUS & CUNLIFFE,
12th and Washington Ave., Philadelphia.

FOR SALE.
CRANK and GEARED SHAPERS.
Write us for Bargains.

J. STEPTOE & CO., Cincinnati, O.

PITTSBURGH

SALES AGENCY,

J. H. HILLMAN, Manager,

No. 8 Wood St.,
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IS NOW ENGAGED IN THE

Sale AND Reorganization

—OF—

Manufacturing Plants,

INCLUDING

Blast Furnaces, Rolling Mills, Machine Shops, Foundries, Agricultural Works, and Manufacturing Establishments Generally.

Examinations and Reports

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References on Application.

Second-Hand Rails FOR SALE.

In lots to suit, and ready for delivery.

2000 tons 60 lb. Steel T Rails.
800 tons 54 lb. Steel T Rails.
400 tons 50 lb. Steel T Rails.
550 tons 50 lb. Iron T Rails.
600 tons 45 lb. Iron T Rails.
2000 tons 40 lb. Steel T Rails.
600 tons 30 lb. Iron T Rails.
150 tons 30 lb. Steel T Rails.
200 tons 25 lb. Steel T Rails.
1700 tons Johnson Girder Rails. 38, 48, 52 and 66 lb. Rails.

All selected and in excellent condition for relaying and only slightly worn. For prices and particulars apply to

JOSEPH JEWKES,
Railway Equipment, Pittsburgh, Pa.

Trustee's Sale of Machine Shop Equipment.

Lathes, 52 in. swing by 41 ft., 54 in. swing by 22 ft., 30 in. swing by 22 ft. One Pit Lathe. Planers, 54 in. wide by 20 ft., 36 in. wide by 13 ft. Drills, 36 in. upright, 5 ft. post, 20 in. post. Engines, 3 new and 7 second-hand, from 100 H.-P. down.

Circular on application.
W. A. BOLE, Trustee,
Liberty Ave., cor. 25th St., Pittsburgh, Pa.

WANTED.

Machinery to manufacture.—Machinery built of Wood and Iron, or all Iron only, wanted, same must be of real merit.

J. M. KRAMER & BRO. MACHINE WORKS,
Maria Stein, Ohio.

WANTED.

A second-hand Squeezier in good order and modern construction, with or without Engine. Name lowest price for cash. Address "H."

Office of *The Iron Age*, 220 South 4th St., Philadelphia, Pa.

FOR SALE Selected Second-hand Rails.

800 tons 35-lb. Tee Iron Rails, 100 tons 30-lb. Tee Iron Rails, all in good condition for relaying, complete with fish plates and spikes. Also several complete switches. Apply to

BRONSON BROS.,
Painted Post, N. Y.

TO LET

In the "IRON AGE" Building,
FOR OFFICES OR STORES,
96-102 Reade Street.

FIRST LOFT, 50 FEET FRONT.

THIRD LOFTS, 100 FEET FRONT.

To Let for Light Manufacturing Business,

Fourth and Fifth Lofts, 50 Feet Front.

Excellent Light, Elevator, Power
and Steam Heat.

APPLY TO

WM. C. WALKER'S SONS,
299½ Broadway.

CHARLES WEILAND.

I make a special business of buying and selling Job Lots of

HARDWARE AND CUTLERY.

Tools and Second Quality Files a Specialty.
Send for Catalogue,

149 Chambers St., New York

WE ARE LOOKING FOR

NEW NOVELTIES

TO MANUFACTURE.

If this concerns you

please communicate with us at once.

THE BRIDGEPORT GUN IMPLEMENT CO.,

313-315 Broadway, New York.

WE OFFER FOR SALE BALANCE OF STOCK OF IRON AND STEEL,

Consisting of Bar, Band, Hoop and Scroll Iron and Spring and Plow Steel, at

1 CENT PER LB.

About 40 tons in all.

List of sizes on application.

JOHN S. LENG'S SON & CO.,

4 Fletcher St. - - - NEW YORK.

DON'T INVEST in expensive machinery or let a contract until you get our estimate for making novelties or parts. Our work on novelties or fine, difficult and accurate parts astonishes the trade. White metal work a specialty, and our results cannot be duplicated at the same cost. Write us. Sample on application. Inventions perfected. Secrecy and satisfaction guaranteed. THE H. H. FRANKLIN MFG. CO., Syracuse, N. Y.

Bicycle Manufacturing Plant For Sale.

Located in a prominent Western city and adapted to the manufacture of bicycles of any grade. Capital required, \$75,000 to \$100,000. For particulars address The R. M. Co., P. O. Box 31, Cincinnati, O.

Receiver's Sale.

Notice is hereby given that the undersigned Receiver of The Vienna Enamel & Stamping Company, will sell the assets of said corporation at private sale to the highest bidder. Bids will be received on and after November 10th and up to November 20th, 1893. The plant is situated at Porter, Porter County, Indiana; all the main buildings are made of brick and have been recently erected and the machinery is new. It is located on two and one-half blocks of ground; there are three railroads within a few rods of it, and it is about forty miles from Chicago. There is also a large amount of manufactured product and of raw material on hand. In fact, there is everything ready to start up with the business.

Terms of Sale: The plant with tools and fixtures will be offered together for one third cash and the balance in equal payments of twelve and eighteen months; the purchaser to give his notes with mortgage on the premises to secure the same, with interest at six per cent, payable annually, and he must keep the property insured in good companies to an amount sufficient to cover loss by fire, payable to the receiver. The manufactured and the raw material will each be offered separately, and the whole will be sold for all cash or one-half cash and the balance in six months; the purchaser giving his note with approved security for the deferred payments, with interest at six per cent.

All bids on the plant, fixtures and tools must be accompanied by a deposit of two thousand dollars cash, conditioned that the bidder will make good his bid if accepted; and all bids on the personal property must be accompanied by a like deposit of two thousand dollars.

EDWARD ECKL,

Receiver of the Vienna Enamel and Stamping Company.

IRON WORKS FOR SALE.

To close estate of John R. Smith, late of Springfield, Mass., the executors offer for sale the old established business of the Springfield Iron works, including real estate, stock and machinery.

This is a live business in ornamental and building iron, machine and drop forgings, bolts, bridges, iron and steel structural work, fire escapes, etc., with several large contracts at the present time, including a State building at Concord, N. H., to be carried out. Mr. John R. Smith was successor to the bridge business of A. D. Briggs & Co. The business is old and well established. Inquire of

RALPH W. ELLIS, Atty.,
Springfield, Mass.

COAL LAND.

Eight thousand (8000) acres of Coal Land, containing two seams, one of four to six (4 to 6) ft. thick above water level; and one seam seven (7) ft. below water level. Good railroad and river facilities. Titles good. Will be sold cheap for cash. Map can be seen by calling or writing to

RINARD & WILLIAMS,
Box 267, Braddock, Pa.

FOR SALE.

A Rolling Mill, not far from Chicago; Cheap Fuel, Cheap Scrap; Good Machinery, comprising 9 in., 12 in. and 18 in. trains, in first-class condition. Can show a profit of \$7 to \$10 per ton on all iron made since mill has been in operation. Don't apply unless you mean business. Other engagements reason for selling. Address "S. F.," No. 1026.

office of *The Iron Age*, 96-102 Reade St., N. Y.

A N OLD ESTABLISHED hardware house in New York, whose salesmen cover the entire United States, wants the sole agency of American manufacturers of Chains, Toilet Clippers, Locks, Files, Carpenters' Tools and similar articles. Address

"W. B. G.," No. 105,

office of *The Iron Age*, 96-102 Reade St., New York.

WANTED

Partner to take half interest in established hardware and house furnishing store in Baltimore, Md.; \$5000 required; want to increase stock is reason for selling. Address "HIRAM,"

office of *The Iron Age*, 96-102 Reade St., N. Y.

IMPORTANT ANNOUNCEMENT. E. Bissell, Son & Co., Auctioneers.

12 Murray Street and 15 Park Place, N. Y.

Nov. 14th and 15th, at 10 o'clock each day.

Large Special and Unreserved Trade Sale of Table and Pocket Cutlery, Carvers, Butcher Knives, Shears, Silver Plated Flat Ware, Etc., Etc.

ALSO

250 Cases Fine Carvers, Pearl Handle Knives, Fruit Knives, Etc., all elegant goods in cases.

ALSO

By order of The Emery-Waterhouse Co., in Liquidation, 1500 Dozen Cast Steel Axes, assorted weights and brands, to be sold on sixty days, time for approved paper without interest.

ALSO

The Largest Line of Quadruple and Triple Plated Silverware we have offered this season, comprising Medium and Dessert Forks, Tea, Table and Dessert Spoons, Fancy Pieces, Hollow Ware, Etc., all of the best makes and stamps.

ALSO

5000 Pair of Acme and Long Reach Skates, manufactured by Keene Mfg. Co., and Sam'l Winslow Skate Co.

This will be our Last Cutlery Sale this Season. It is important that the Jobbing and Retail Trade and Department Stores should be represented.

The Entire Sale Absolutely without Reserve.

WANTED.

One Air Compressor, Belt Driver, about 12 in. Cylinder. State price, delivered at Communipaw, N. J., also when and by whom made. Address THOMAS A. EDISON, Orange, N. J.

PARTNER WANTED.

A partner with \$8000 to engage in the Hardware business in the best city West of Chicago; business established and prosperous. Address "HARDWARE PARTNER," office of *The Iron Age*, 96-102 Reade St., New York.

WANTED.

Practical Boiler Maker with small capital and business, to take interest in small shop. Fair business established and a good opportunity to an energetic man of ability. Applicants must be well recommended as to mechanical ability and moral character, and other things equal American preferred. Address "W. B. & S.,"

office of *The Iron Age*, 96-102 Reade St., New York.

FLOOR PLATES.

FOR SALE.—A Superior Lot of Cast Iron Plates 2 ft. x 4 ft. They are made to avoid warping and cracking. Will sell in lots to suit.

MATTHEW GILL, JR.,
308 Walnut St., Philadelphia, Pa.

WANTED.

To furnish reasonable estimates on specialties in light metal work.

CLARK & COWLES, Plainville, Conn.,
Manufacturers of Clock Trimmings, Rivets,
Springs, &c.

Collections?

ATTENTION! Merchants and Manufacturers.—We collect your past due accounts. Do not let them remain too long upon your books. Our terms just and fair.

THE HARDWARE BOARD OF TRADE, Ltd.,
4 and 6 Warren street, New York.
JAS. H. GOLDEY, Treas.

FOR SALE.

Good stock of Hardware, invoice \$5,000, good store building with living rooms above, valued at \$2,500, in a good town in Southwestern Minnesota; only hardware store in the town; good established trade of \$15,000 a year. This is a rare chance to go into business. Address

F. A. & A. J. MEACHAM,

Edgerton, Minn.

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The Colliery Manager's Handbook. By CALLE PAMELY. A comprehensive treatise on the laying out and working of collieries. A book of reference for colliery managers and for the use of coal mining students preparing for first-class certificates. 600 pages and 600 illustrations. Second edition revised with additions. 8vo, cloth.....\$1.50

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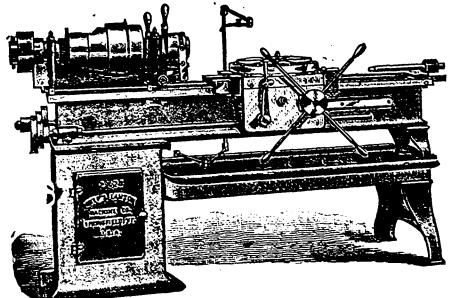
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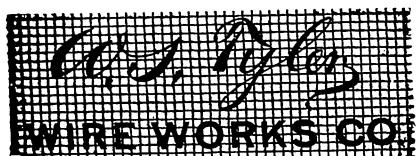
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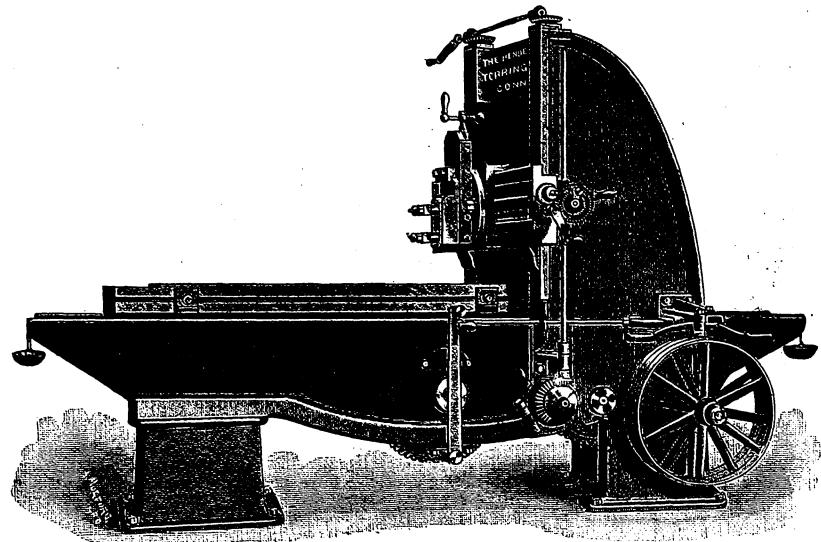
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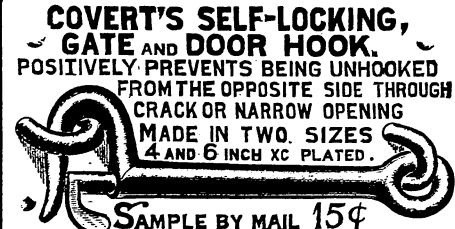


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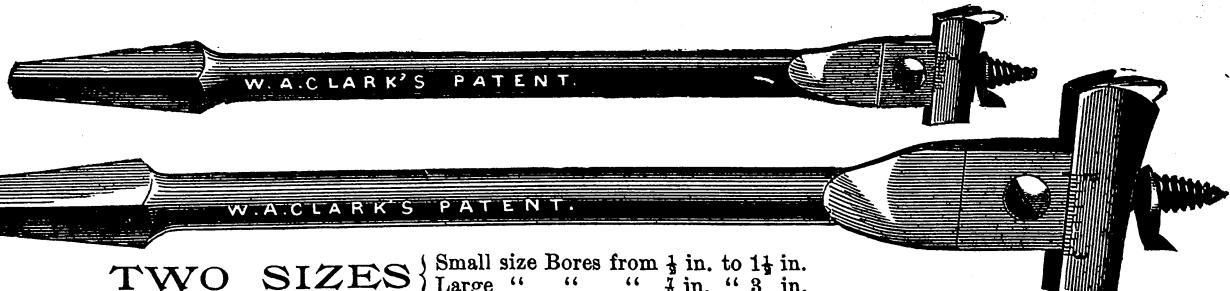
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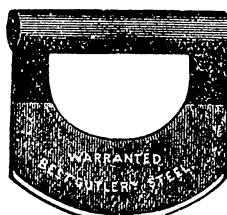
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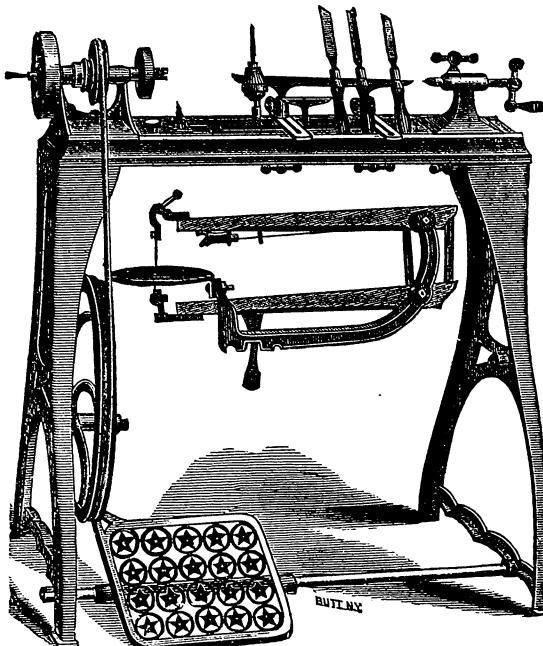


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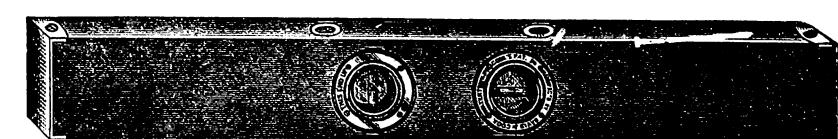
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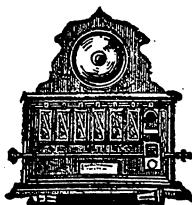
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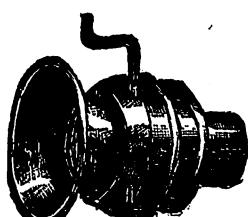


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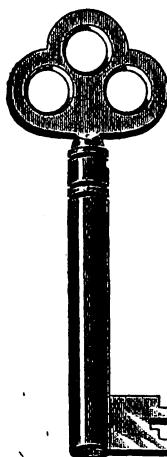
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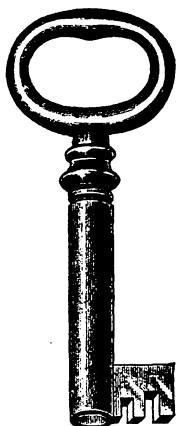


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STAMFORD, CONNECTICUT.

New York. Chicago. Philadelphia. Boston. Pittsburg. San Francisco.

THE DEALER who sells what.
THE PEOPLE ask for.

MAKES FRIENDS and MONEY, and
SAVES TIME and TROUBLE.

The people ask for

LePage's Liquid Glue,

And the people are right.

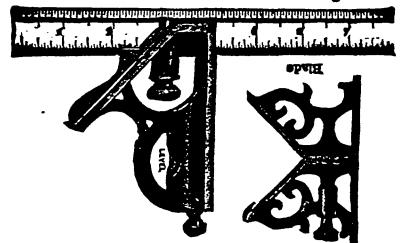
It is the strongest and best glue made. It has been imitated, but never equalled. Be sure to get what you order and ACCEPT NO SUBSTITUTES.

Our name is on every label

RUSSIA CEMENT CO.,
GLOUCESTER, MASS.

New York Office, 95 Reade and 113 Chambers Streets.
Pacific Coast Office, 23 Davis Street, San Francisco, Cal.

CHAPLIN TRY AND CENTRE SQUARE.



Also a full line of

MACHINISTS' FINE TOOLS.

If you haven't our 1893 catalog send us a postal card.

STANDARD TOOL CO.,
ATHOL, MASS., U. S. A.
ATHOL MACHINE CO., Selling Agents.

NONPAREIL Ratchet Wrenches.

Made of best forged Tool Steel; are easily and readily adjusted and controlled. Can be made reversible instantly without removing from their work by throwing over the lever in slot of the handle.

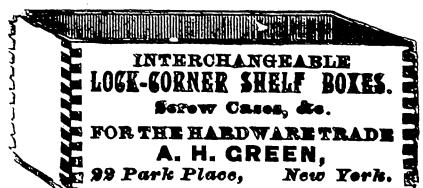
The Set of Combination Tools No. 1 includes the wrench, two sockets, one for screw-driver, bit or reamer shank, with wood handle, and one socket



for drill shank and feed nut. The jaws on this wrench open from 3-1/8 to 1-1/4 inches.

Send for Illustrated Circular and Price-list of various sizes

The Keystone Mfg. Co.
312 Terrace, Buffalo, N. Y.



— REMEMBER —
WE MAKE ONLY
The Very Highest Grade
OF
MECHANICS' TOOLS.
N. H. MAYHEW CO., Shelburne Falls, Mass



W. & B. DOUGLAS, MIDDLETOWN, CONN.

Branch Warehouses: 85 and 87 John St., New York; 197 Lake Street, Chicago, Ill.

THE OLDEST AND MOST EXTENSIVE MANUFACTURERS OF

Pumps, Hydraulic Rams, Garden Engines,

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

A LARGE CAPACITY AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries,

Fig. 209.

Fig. 381.

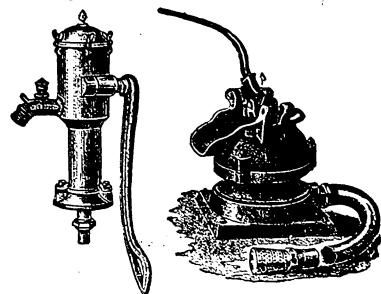
Fig. 145.

or wherever it is desired to raise a large quantity of water by hand power.

The pump has large valves (accessible by hand), and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

CAPACITY

from 3,000 to 4,500 gallons per hour.

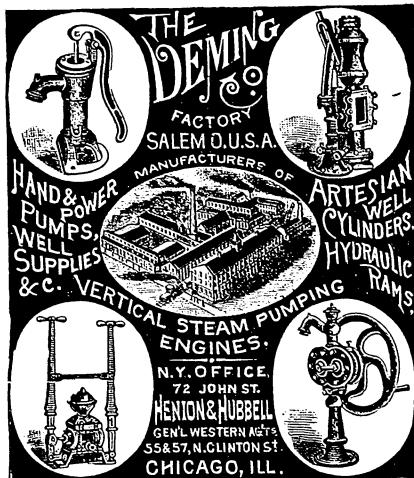


These pumps are simple, durable and low priced. Made either as shown in cut for Hose or for IRON Pipe Suction underneath.

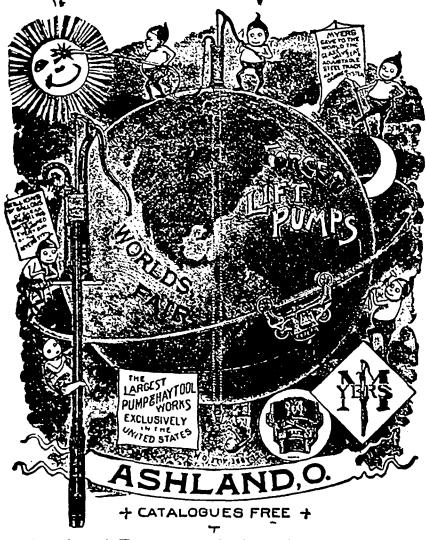
Send for Circular and Price List.



C.I. Grindstone Frame.



F.E. MYERS & BRO.



The New York Safety Dumb Waiter,
"The Manhattan Dumb Waiter,"
"The Improved Humphrey Hand Elevator,"
Made specially to be sold by Hardware Stores. Thousands in use. Catalogues on application.

THE STORM MANUFACTURING CO.
NEWARK, NEW JERSEY.
Formerly of Poughkeepsie, New York.

V I S E .

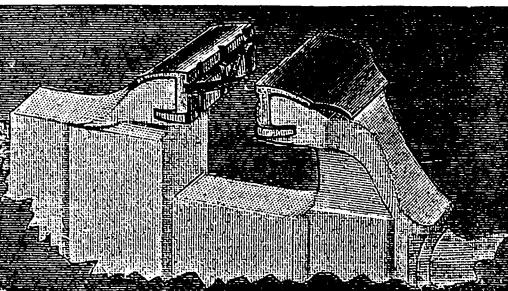
Patented Dec. 27, 1892.

IT HAS QUALITIES THAT ARE UNDISPUTED.

Rapid, Active, Prompt.

One movement in and out, one turn of the hand and the work is secured.

The Capital Machine Tool Co., AUBURN, N. Y.



BINGHAM PATENT VISE JAW CAP

Will Fit any Kind of Vise.

For protecting finished work. Will hold finished rods of any shape without injury.

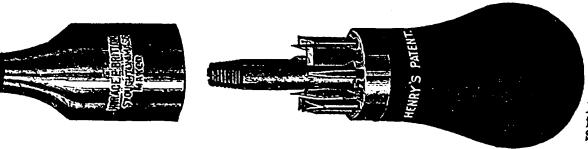
3 1/2 inch.....per pair, 40 cents.

4 " " " " 50 "

4 1/2 " " " " 60 "

PRENTISS VISE CO.
44 Barclay St., New York.

HORACE E. BRITTON, Stoughton, Mass., Manufacturer of the **HENRY'S PATENT COMBINATION HAFT**,



AND OTHER TOOL SPECIALTIES.

The Combination Haft contains six Brad-Awls, one Chisel, Screw Driver, Diamond Point Awl, Marking Awl, Tack Puller and Reamer. Send for Circular and Prices.

Full Set Sent Post-paid on receipt of \$1.00. (No stamps.)

NEW ADJUSTABLE BENCH LEVEL.

WITH GROUNDED AND GRADUATED VIAL.

4-6 and 8 inch.



Three Sizes.

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THE KNAPP & COWLES MFG. CO.,
Bridgeport, Conn.,
Makers of a large line of
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Hardware Specialties.
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MANUFACTURERS OF

Improved Adjustable Window Screens.
THE QUEEN ANNE. With box panels; the only screen made and finished alike on both sides.
THE EUREKA. The best cheap extension screen on the market.
SCREEN DOORS. Finished all ready to hang
Sticks, Corners, Improved Frames, &c.
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 MANUFACTURERS OF EXCELSIOR MEASURING TAPES.
 SUPERIOR QUALITY, LATEST IMPROVED. GREATEST VARIETY.
 STEEL, METALLIC, LINEN, POCKET TAPES.
 EXCELSIOR BAND CHAINS FOR SURVEYORS, LAND CHAINS, &c.
 K & E C^o FOLDING POCKET RULES.
 NO WARPING, NO SHRINKING, NO ILLEGIBLE JOINTS, NO BULK.
 2 3 4 5 6 8 FOOT, ALSO WITH PATENT SPRINGS.
 FLAT & TRIANGULAR BOXWOOD SCALES, BEST MADE.
 PLUMB BOBS, THUMB TACKS, DRAWING INSTRUMENTS.
 PRICE LISTS & QUOTATIONS PROMPLY SENT.

HIGHEST GRADE PLATED WARE MADE.

THE MAJESTIC.

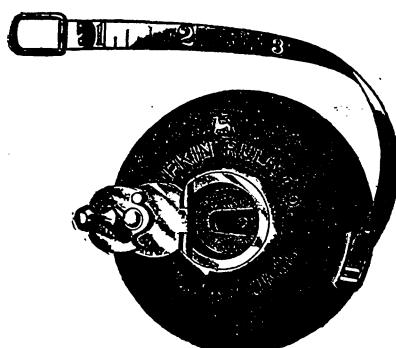
Design Patented August 29th, 1893.

All our goods Sectional Plated on parts most exposed to wear.

Branch Offices:
 19 Murray St., New York.
 110 & 112 Wabash Ave., Chicago.
 722 Chestnut St., Philadelphia.
 133 Charles St., Baltimore.
 120 Sutter St., San Francisco.

The Rogers and Hamilton Co.,

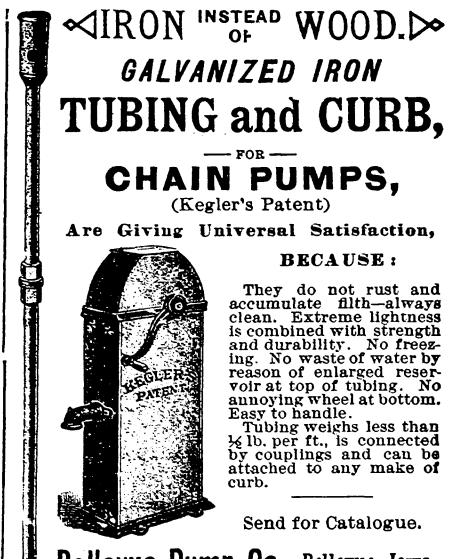
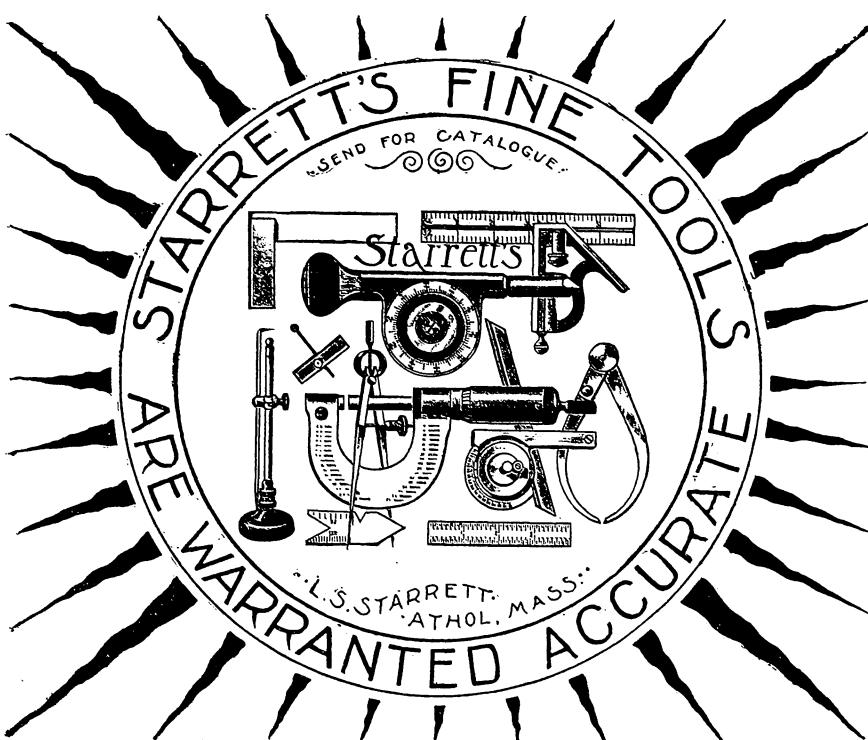
Factories and Main Office, WATERBURY, CONN.
 FOR SALE BY ALL THE LEADING JOBBERS.



“RELIABLE” Steel Measuring Tapes.

Entirely new. Handle or crank when closed is perfectly flush with leather case. Opens by pressing button on opposite side and folds out double, giving increased leverage. Best and most convenient steel tape on the market. Fully guaranteed. Will send samples on approval. We carry a complete stock of our goods at our New York Office, 20 Murray St.

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Specially adapted for drill press work where chucks cannot be used and equally good for special or regular bench work.

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 Manufacturers all styles VISES.



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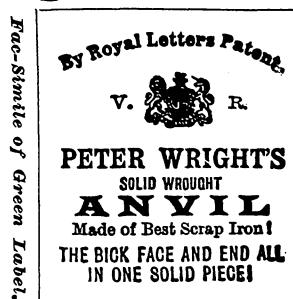
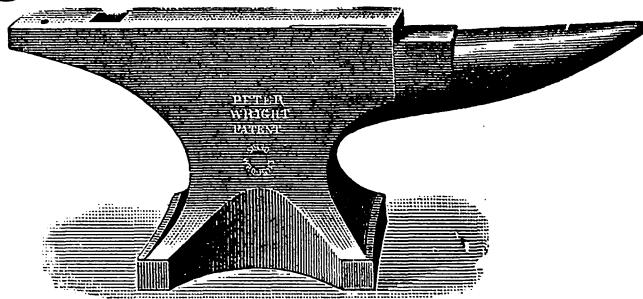
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Peter Wright's Patent Solid Wrought Anvil

PETER
WRIGHT
PATENT

SOLID
WROUGHT

Fac-Simile of Trade-Mark.



You are cautioned in buying to see that each anvil is stamped with the full trade-mark on one side and has the green label affixed to the other.

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BAND,
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SAWS

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C. A. HILES & CO.,
336-338 Carroll Ave. CHICAGO.

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1798.

INCORPORATED
1891.

JOS. F. McCOY CO.

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Headquarters for

Coates' Horse Clipper

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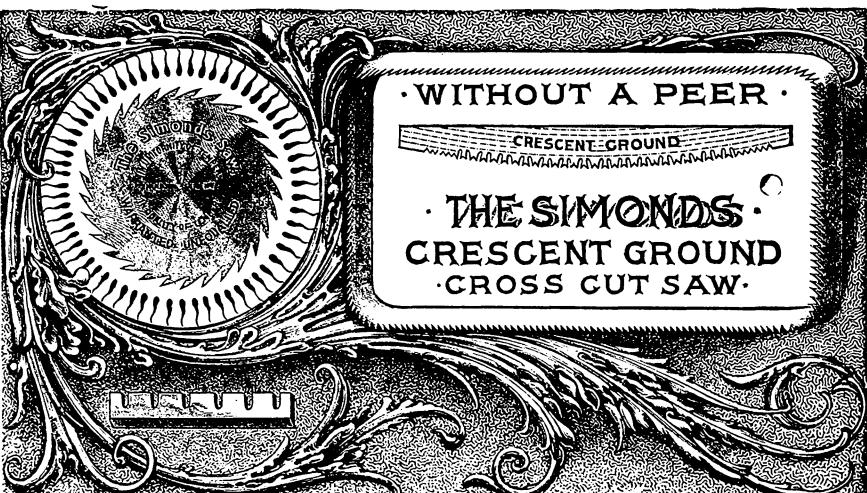
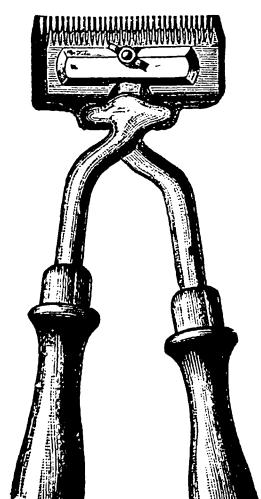
Clippers.

ALSO

THE "BELL"
AND
THE "COMET"

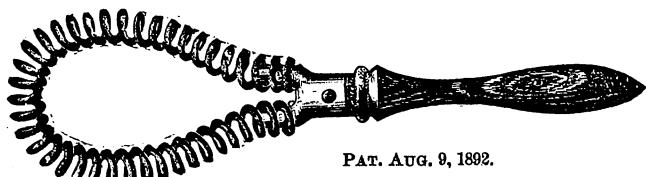
Horse
Clippers.

At prices to suit
the times.



Simonds Mfg. Co. Simonds Saw Co.
FITCHBURG, MASS. CHICAGO, ILL. SANFRANCISCO CAL. PORTLAND, ORE.

THE BOSS DUST BEATER.



PAT. AUG. 9, 1892.

NEAT, DURABLE, AND DOES THE BUSINESS.

For removing dust and filth from Clothing, Upholstered Furniture, Rugs and Carpets it is just the thing. Will raise the nap and so improve the appearance. Will not, like other Dust Beaters, leave marks, nor tear the fabric. The coil is of steel wire secured in a malleable iron socket and attached to an enameled wooden handle. Just what everybody wants.

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PEABODY & PARKS,
Manufacturers,

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"If you want a Saw it is best to get one with a name on it which has a reputation. A man who has made a reputation for his goods knows its value as well as its cost and will maintain it."—HENRY DISSTON.

THE SAWS THAT LEAD THEM ALL

DISSTON & SONS' PATENT D-8 HAND SAW.

"THE
SAW;"
HOW
TO
CHOOSE
IT,
AND

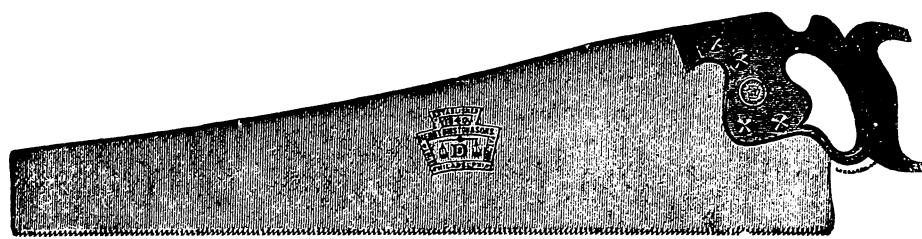
HOW
TO
KEEP
IN
ORDER,

Sent
Free
on
Receipt
of
Name
and
Post Office
Address.

"POCKET
EDITION
OF
THE
SAWYER"

"LUMBER-
MAN'S
HAND
BOOK,"

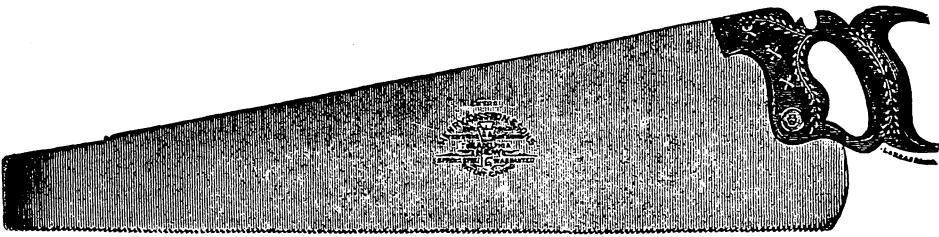
Sent
Free
on
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of
Name
and
Post Office
Address



This Saw combines all the valuable improvements in Hand Saws that have been made by us of late. The first and most important is the hollow or skew back, the success of which can best be attested by the number sold. The peculiar shape of the butt or heel, coupled with the new method of fastening to the handle, give a full stroke of the blade without fear of catching or hooking in the work; and as the handle is put further on the blade you have a full stop on the proper point and a greater command over your Saw, by reason of being two inches nearer the point, which must give more power.

The Saw being let into the handle on a circle, has a perfect bearing, which, with the new screws, makes it stronger and almost impossible to work loose, and avoids the unsightly gap that is seen on the back of the old style handle. All the above features are patented.

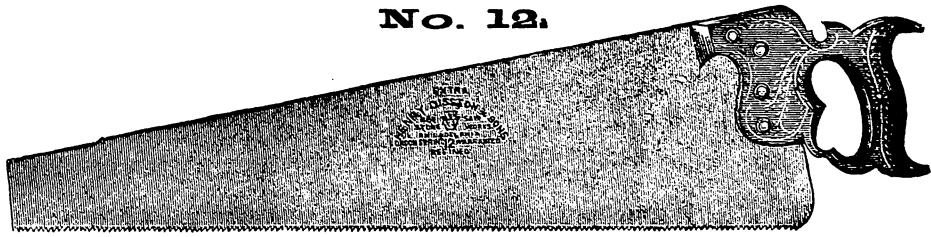
Our New No. 16 Premium Saw.



AN EXTRA FINE SAW IN EVERY RESPECT.

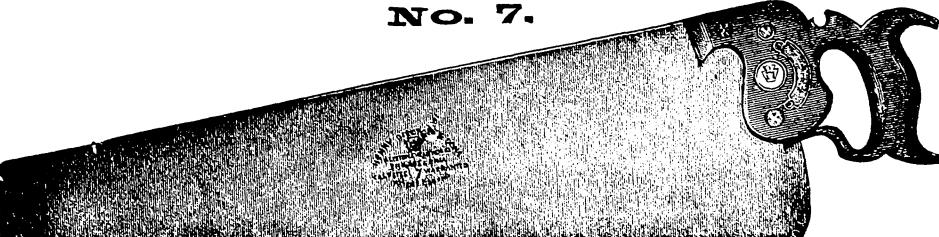
Having the Latest Close up Handle, Spring Steel Blade, Extra Thin Back, Finely Grained, with an Apple Handle and Four Brass Centennial Screws.

NO. 12.



DISSTON & SONS' Extra Refined London Spring Steel, Selected and highly Polished Blade, Handle Carved and Polished, 4 Improved Brass Screws, the finest Hand Saw manufactured.

NO. 7.



DISSTON & SONS' Cast-Steel, Warranted, Beech Handle, Polished Edge, 4 Improved Screws, Grained Blade.

ASK YOUR DEALER TO ORDER THEM FOR YOU.

HENRY DISSTON & SONS

(INCORPORATED),

Keystone Saw, Tool, Steel and File Works, Philadelphia, Pa.

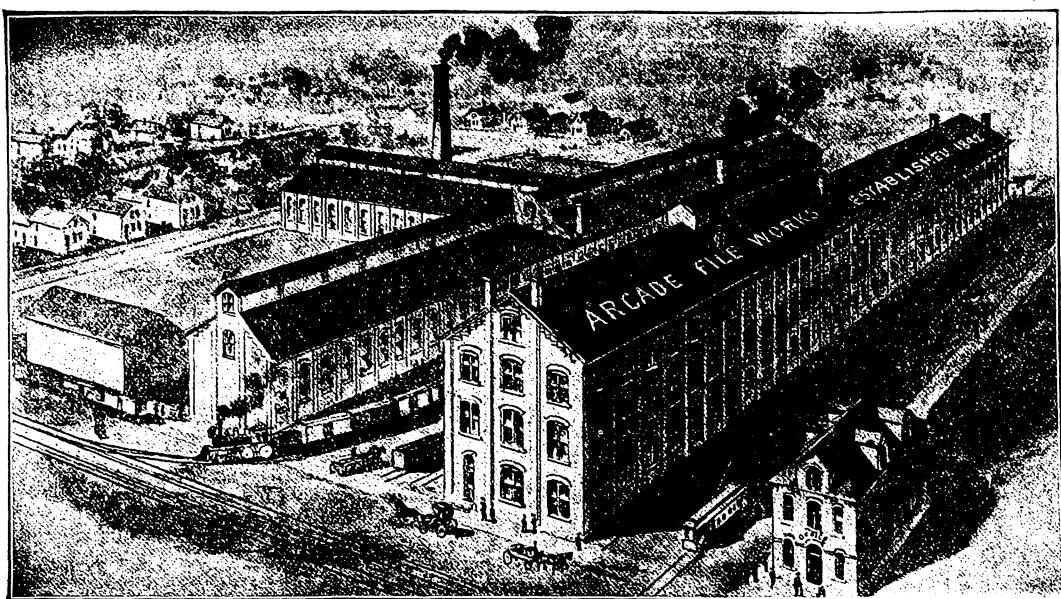
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Alfred Weed, Vice-Pres. & Gen. Manager.

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Works: ANDERSON, IND.

THE FILES THAT LEAD THEM ALL.

THE BEST EQUIPPED FILE WORKS IN THE WORLD.

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ACME CUTTING TOOLS.

Made in all Sizes.



SOLID STEEL ACME PLIER.
AND WIRE CUTTER.
Made with cutters of best steel.



ACME CUTTING NIPPER.
Jaws of Choicest Tool Steel, dove-
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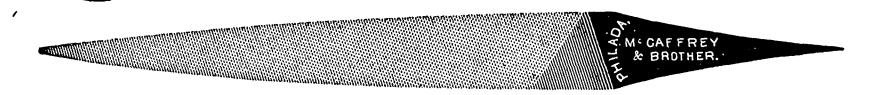
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For Superiority.

McCaffrey File Co.,

FIFTH and BERKS STS.,

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Manufacture and keep in stock a full line of FILES and RASPS only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

Superiority acknowledged wherever used, sold or exhibited.

BEST
CRUCIBLE
STEEL.

"TROJAN" HORSE RASPS.

LOWEST
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STRONGEST
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BANKER & WHITE,

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LET
US
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HIGGANUM HARDWARE CO., HIGGANUM, CONN.
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JESSE JONES & CO.,
HARDWARE
SHELF BOXES

Made of Wood.
No screws or
nails used to work
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Send for circular and list of references.

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Machine Knives, Shear Blades,
Presses and Dies.

Nos. 558 to 562 Water Street, New York.

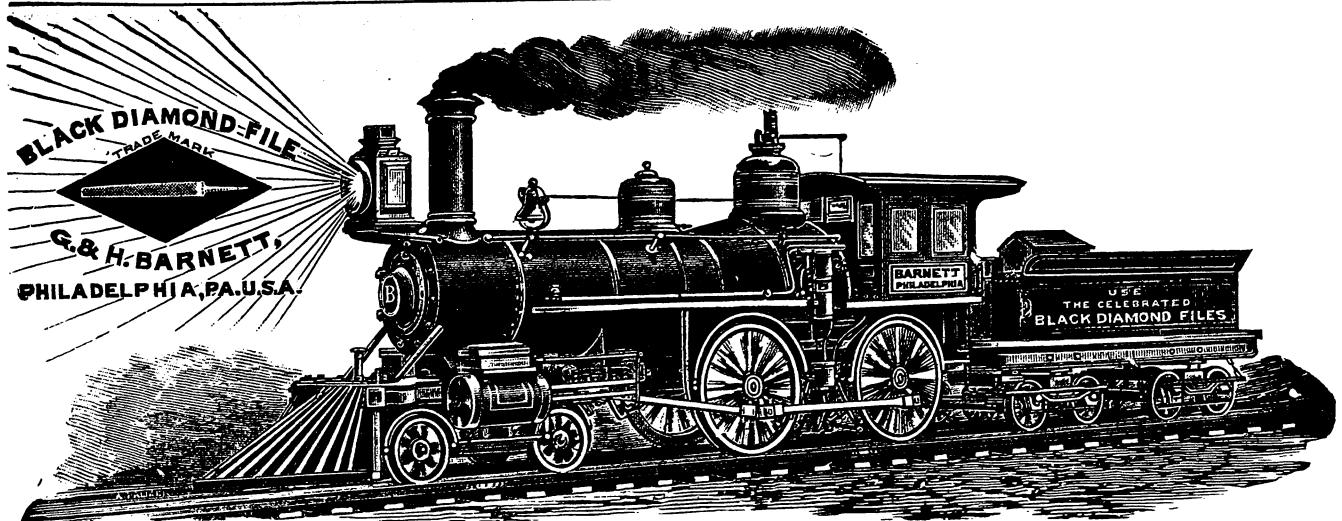
The Taintor Positive Saw Set.

Mechanics are now inquiring for this tool, and Hardware Dealers should have them in stock, or at least have a sample.

For Prices and Discounts, address

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84 and 86 Chambers Street, NEW YORK.

23 LAKE STREET, - CHICAGO, ILL.
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Manufacturers of
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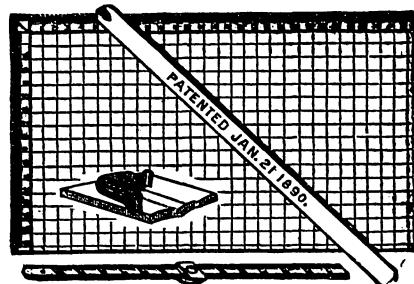
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Also Manufacturers of BLACKSMITHS' and
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TAPER TAPS, HAND, NUT and SCREW
TAPS, PIPE TAPS and REAMERS.

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The Canton Glass Board.

Cuts any Fraction of an inch by Eighths.

Unequalled for accuracy and quick work in cutting square or at any angle. Saves breakages, &c.

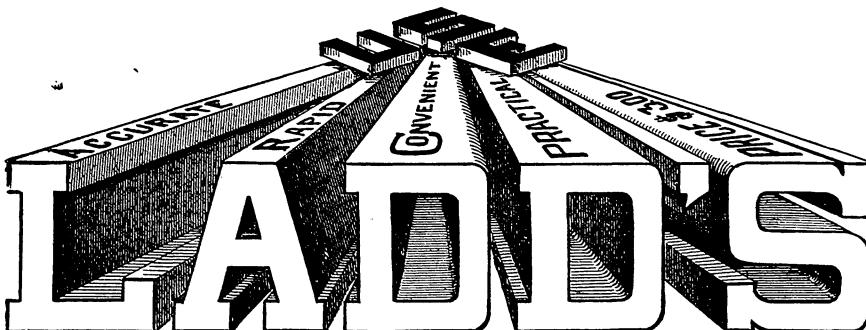
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VARIETIES FILES
3000
CUT FILES

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Have established and maintained their reputation for superiority, against all Competitors, from

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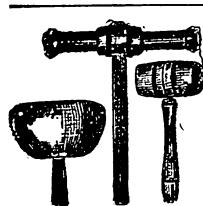
MALLETS.

Also Cotton and Bale

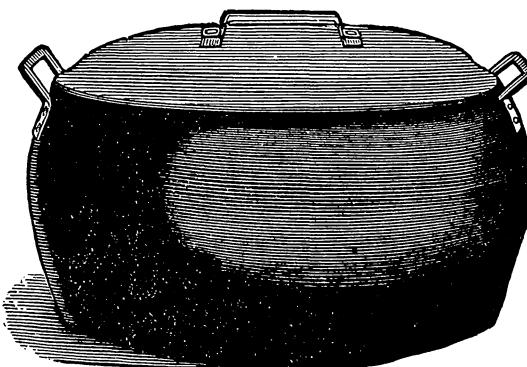
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Patented Feb. 18, 1877, a new combination of Hooks.

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Hollow Ware,
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THE TRADE acknowledges our
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BUTCHERS' STEELS

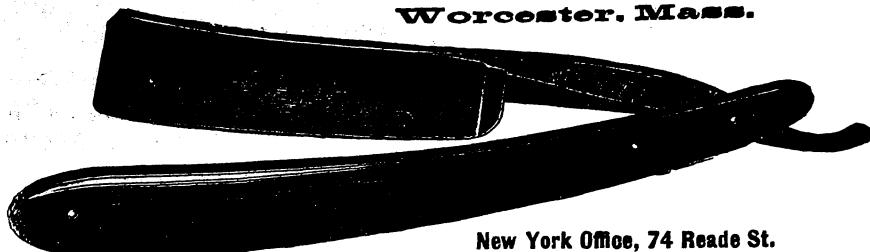
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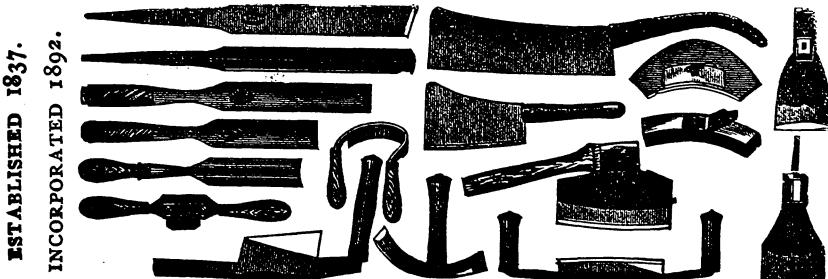
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MANUFACTURERS OF
Coopers', Carpenters' and Ship Tools, Plane Irons,
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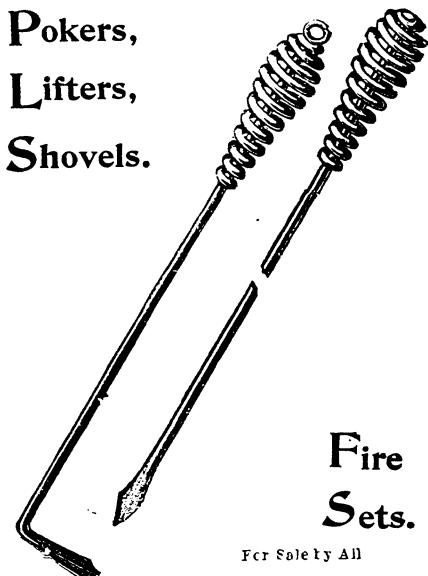
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Commission Hardware,
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STOVE TRIMMINGS.

Pokers,
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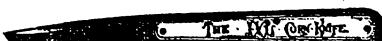
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For Safety All

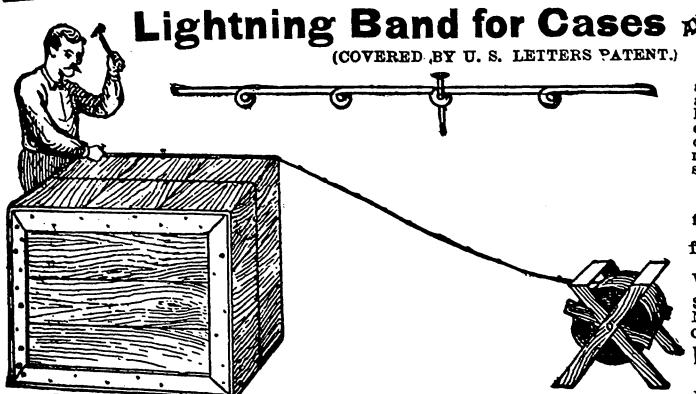
First-class Jobbers in Hardware.

Made under Gaitly Patents and only by
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Knives or Razors,
SEND TO
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Lightning Band for Cases and Crates.
(COVERED BY U. S. LETTERS PATENT.)

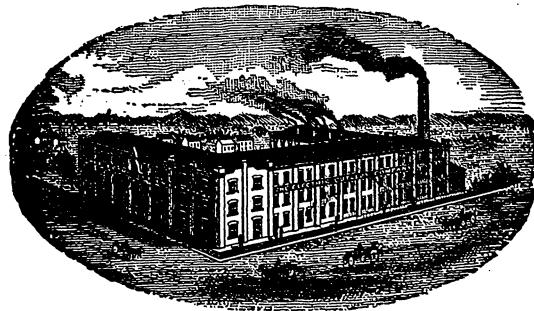
Mounted on reels and
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and convenient to
handle. Easily and
quickly binds shipping
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neat, strong and sub-
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PRICES:

No. 1, per reel of 2000
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Pliers for cutting
wire, 50 cents extra.
No. 1 for cases under
300 or 400 pounds, and
No. 2 for all heavier
cases.

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Sole Manufacturers,
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The Best Equipped Cutlery Works in the World.



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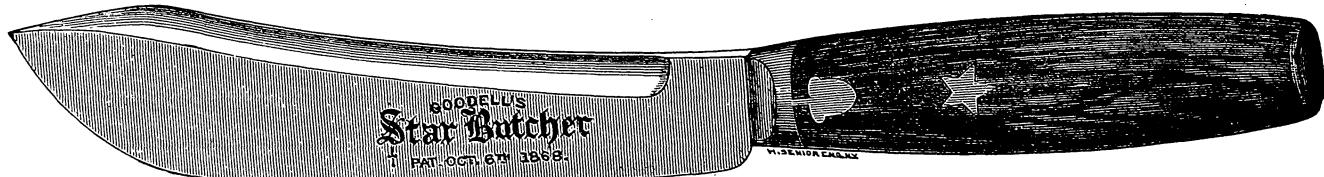


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TABLE CUTLERY, BUTCHERS' CARVERS, PLATED GOODS, &c.

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**THERE IS NOTHING NEW
TO SAY ABOUT THIS KNIFE EXCEPT
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WE DON'T KNOW HOW TO IMPROVE IT.

Blade is made of steel especially prepared for the purpose, and it is made just right; finish excellent; shape unsurpassed; the handle just fits the hand.

GENERAL APPEARANCE IRREPROACHABLE.

Made in sizes from 5 inch to 8 inch; a strictly first-class butcher knife at a moderate price.

WE HAVE OTHER BUTCHER KNIVES,

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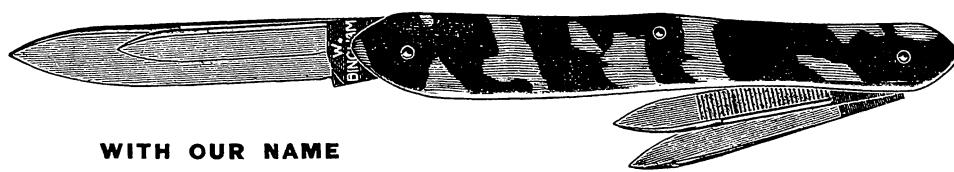
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That money
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experience can
buy.

Knife,
Razor,
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**IS THE BEST
THE W. BINCHAM CO., CLEVELAND, O.**

"SHUT DOWN! What's the Matter?"

"BELT BROKE AGAIN!"

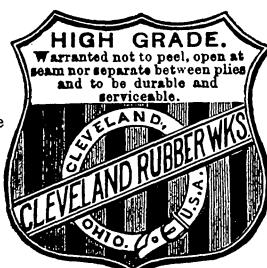
"See here, Mr. Foreman, if you don't have fewer stoppages I'll——"

"Stop, Mr. Proprietor, the fault is yours. Quit buying belts that crack, peel, open between plies, stretch and break, and I'll give you a smooth run. You think it economy to buy cheap belts from Worthless & Co. Why! the time lost and trouble

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Write for Prices and Samples.



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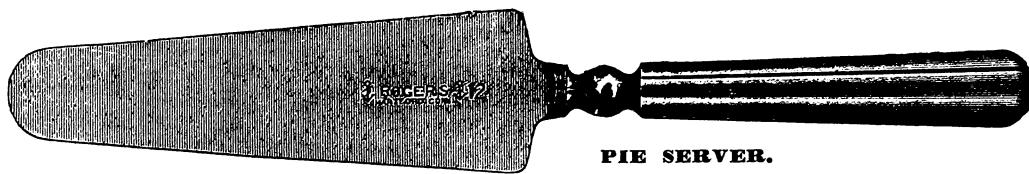
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—NONE BETTER—

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SILVER PLATED WARE.



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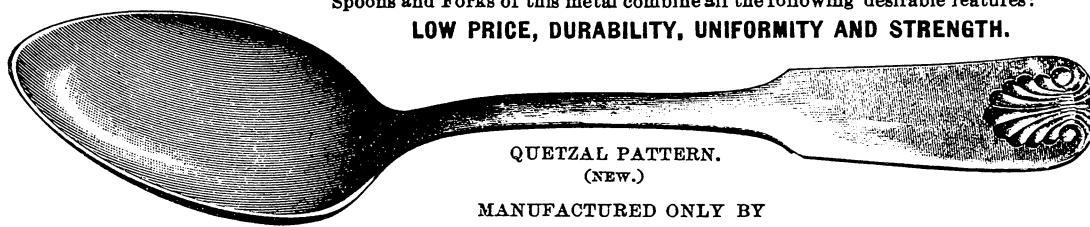
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AZTEC COIN METAL

MADE INTO SPOONS AND FORKS.

Spoons and Forks of this metal combine all the following desirable features:

LOW PRICE, DURABILITY, UNIFORMITY AND STRENGTH.



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THE HOLMES & EDWARDS SILVER CO.,

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AZTEC COIN METAL
has no plating to
wear off. Made
of solid metal.
Easily kept clean.



outs, Kennel Chains, &c.; also cut to lengths for manufacturers' use.

The cut represents the exact size of 6/0.

Thirteen Sizes made, 6/0 being the Largest.

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Chain, made into Halters
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Edge Tools**Hammers**

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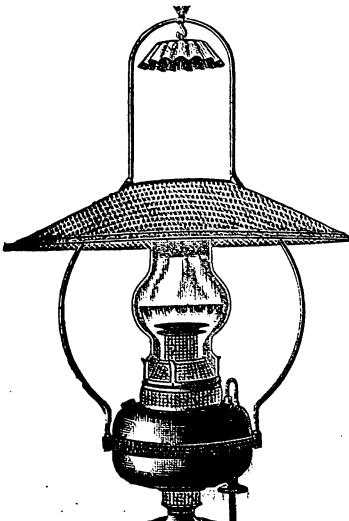
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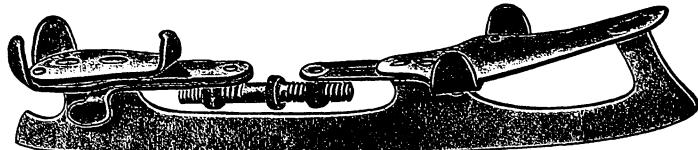
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The most extensive Skate Factory in the World.

Just the thing for the
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PRICE LOW.

SEND FOR DESCRIPTION.

NEW HAMMERLESS DOUBLE GUN,

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Forehand Arms Co.,
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Also makers of a large
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REVOLVERS.

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Warranted Better than the Best

ESTABLISHED 1843.
MORE THAN 200 DIFFERENT PATTERNS.

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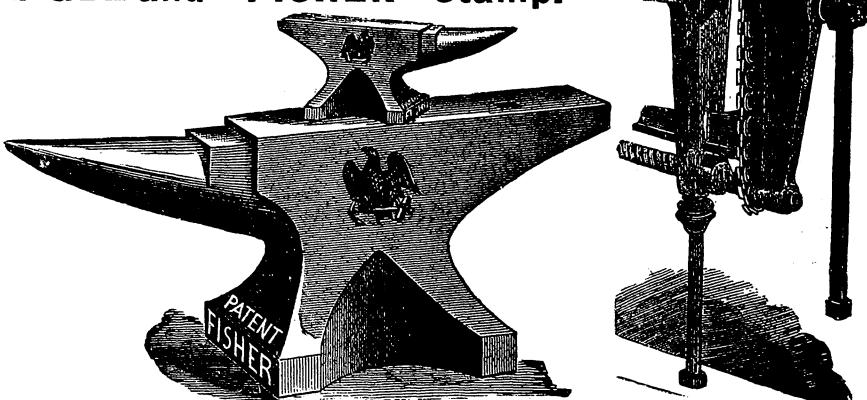
Face in one piece of BEST TOOL CAST STEEL, PERFECTLY WELDED, perfectly true, of hardest temper, and never to come off or "settle." Horn of tough untempered steel, never to break or bend. Only Anvil made in the United States fully warranted as above.

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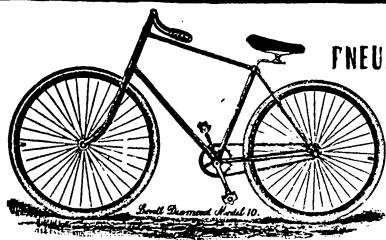


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Properly Designed,
Practically Made,
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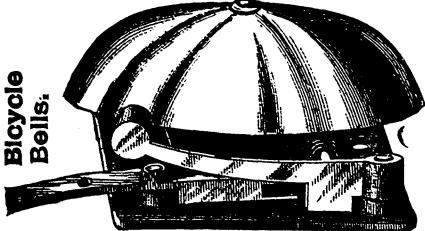
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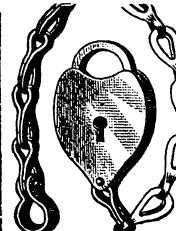
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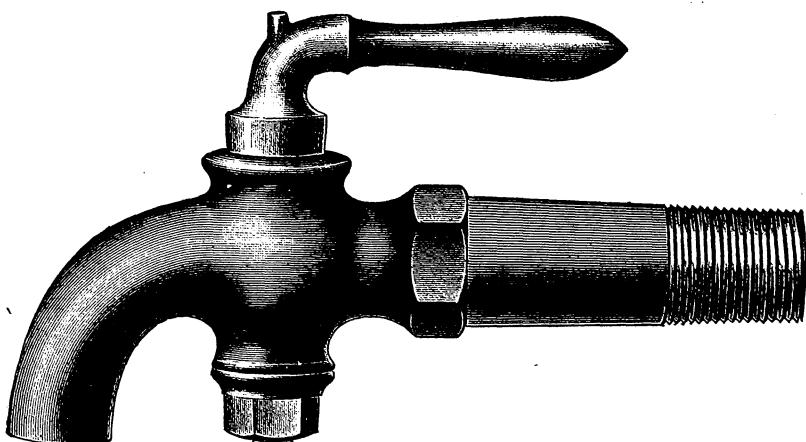
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SCARDMAN BRITANNIA SPOONS
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THEIR MAKE IS EQUAL EAST HADDAM & SON
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HAVE BEEN IN BUSINESS SINCE 1840.

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These Faucets are made from the best Refined Iron, with Solid Brass Key, and are fully warranted. The bearing is longer than in the ordinary faucet, making them less liable to break. Made in following sizes.

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LIST, \$6.75 \$8.25 \$9.00 \$10.50 \$12.00 per Dozen.

Write to us for Discounts, we can interest you.

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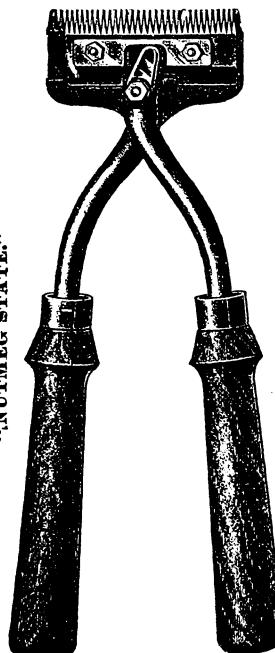
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RIFLE TAKEN APART. IT IS SIMPLY IMPOSSIBLE
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THAN ARE ON THIS RIFLE.

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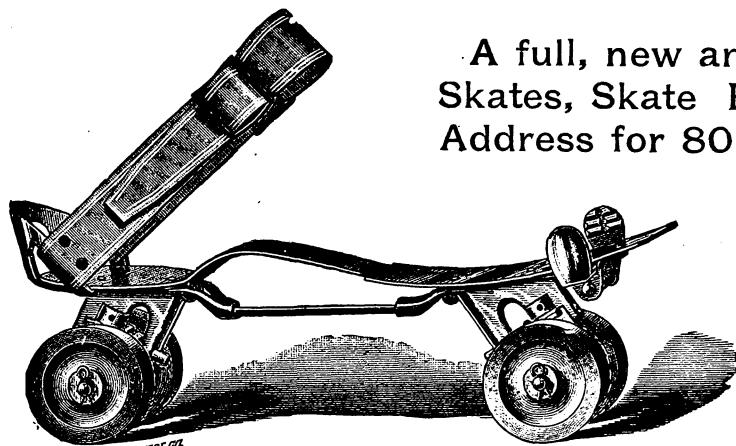
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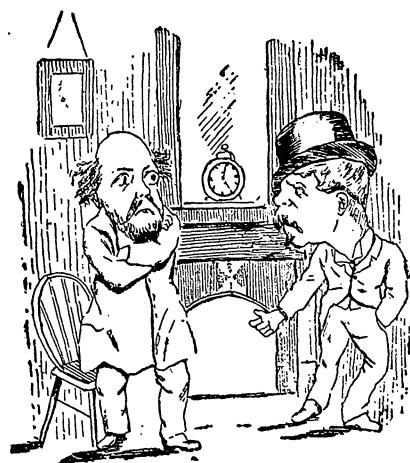
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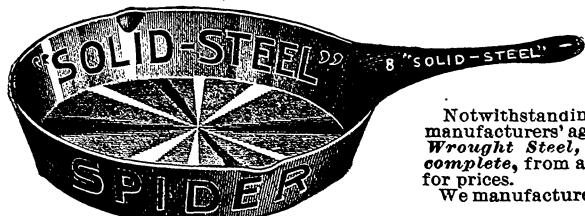
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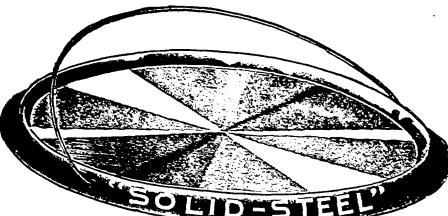
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Steel Letters and Figures.

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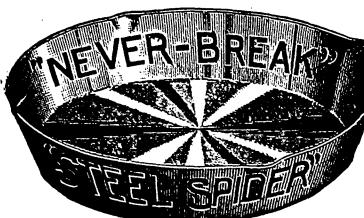
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"MIRROR POLISH," the only Perfect Plain Steel Finish.

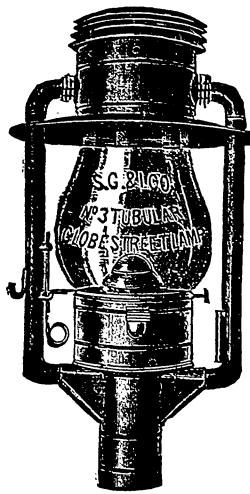
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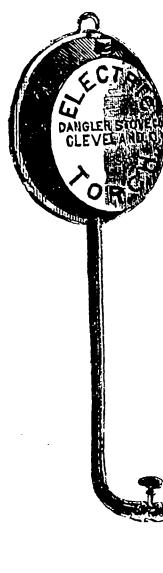
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IS THE Best Street Lamp Manufactured.
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FOR
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14 JETS OF LIGHT
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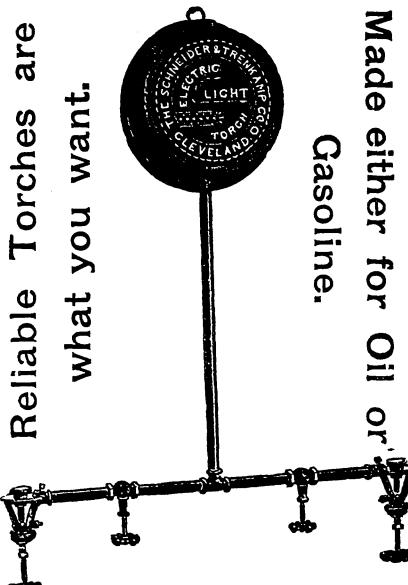
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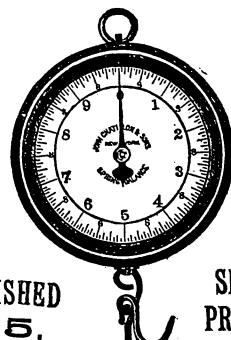
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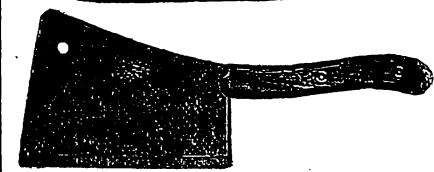


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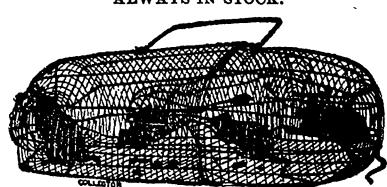


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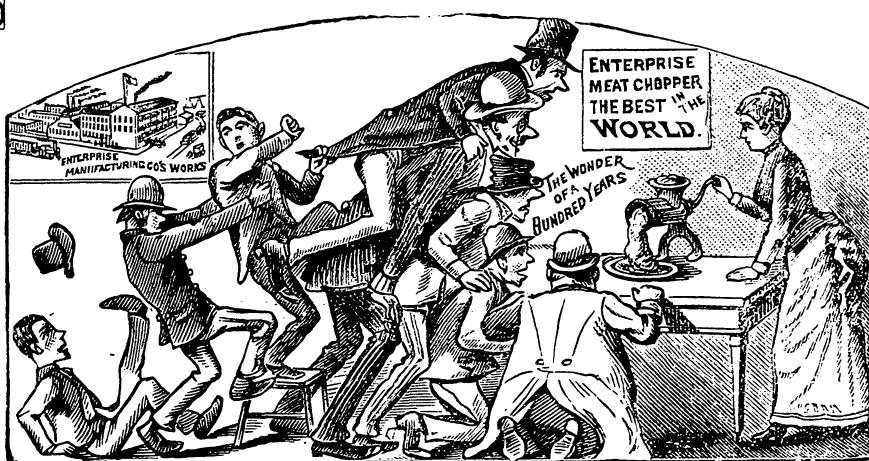
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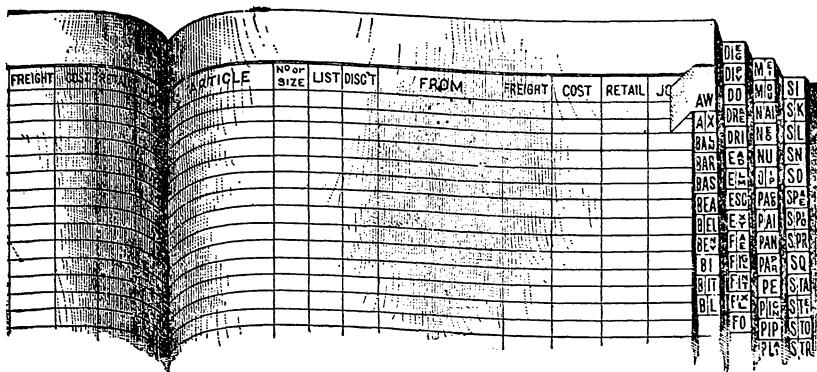
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WITH MULTIPLE INDEX (Patent Pending).



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Fac-Simile of Indexing.

SIZE.—The book is 8½ x 11 inches (much larger than Price Books A, B, C, D or E), 556 pages.

PAPER.—The paper is the celebrated Crane's heavy ledger paper, tough and strong, permitting frequent changes and erasures.

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INDEX.—By means of the arrangement shown in the cut the four rows of index applies to every page (except Supplement) and permits reference to any article at a single motion. This greatly facilitates the use of the book, avoiding the troublesome turning from page to page which is necessary in connection with other Price Books. It has been prepared with great care, and it is believed that it provides a place for every article in the Hardware line, and gives ample space for recording prices.

Sufficient space has been provided for large lines of goods such as Axes, Bits, Springs, etc., by allowing four pages to such indices, instead of two pages, as for lines of goods requiring less space. This is accomplished, as in AX for example, in Book F by having a short tab with the letter A on the tab on the first leaf, and AX on the tab on the second leaf. The A on the first leaf is directly over the A on the lower leaf, so that the index reads AX whether looking at both leaves together, or at the lower one only.

The four rows of index tabs are printed in gold letters on black Russia leather. The tabs are securely fastened on both sides of each page, making a handsome and durable index.

ARRANGEMENT.—The book is arranged to keep a complete record of prices on a single page, the width giving sufficient room.

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Advantages of Multiple Index Price Book.

A SPECIAL feature of the books is the arrangement of the index characters, which, instead of being alphabetical, are arranged with special reference to the classification of Hardware goods, each index character giving the first two or three letters of the names of Hardware articles as shown above. The ease and convenience with which the books can be used is indicated in the following examples, taken from Book F:

For Augers,	turn to	AU	For Chisels,	turn to	CH ^U	For Iron,	turn to	IRO
" Parers, Apple	"	PAP _R	" Cutlery,	"	CUT	" Irons,	"	IR'S
" Saws,	"	SAW	" Cartridges,	"	CAR	" Shovels,	"	SH _R
" Pumps,	"	PUM _N	" Rules,	"	RUB _L	" Grindstones,	"	GRI
" Bits,	"	BIT	" Locks,	"	LO	" Stones,	"	STO

Special care has been taken to make the classification as indicated in the index correct and comprehensive, making provision for all Hardware articles and giving sufficient space for the keeping and recording of prices. It is thought that every strictly Hardware article has its first two or three letters given, thus permitting immediate reference to it by a single motion.

It is, however, obvious if any articles are not directly designated by the index characters, that the index, being alphabetical in its arrangement, indicates the place where quotations on such articles should be recorded. The supplement, however, may be found useful for quotations on any outside goods which the Hardwareman may desire to keep prices on, while at the same time it may be used if necessary for any overflow of matter from the preceding pages, or to contain list prices or other matter relating to goods.

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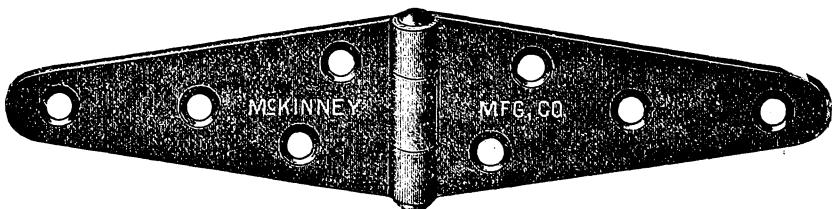
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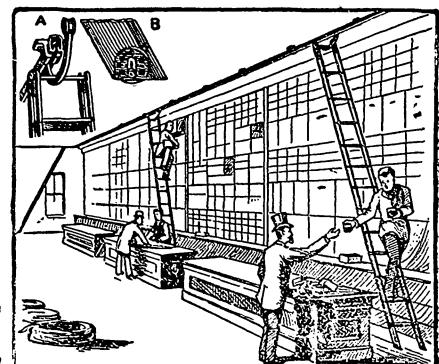
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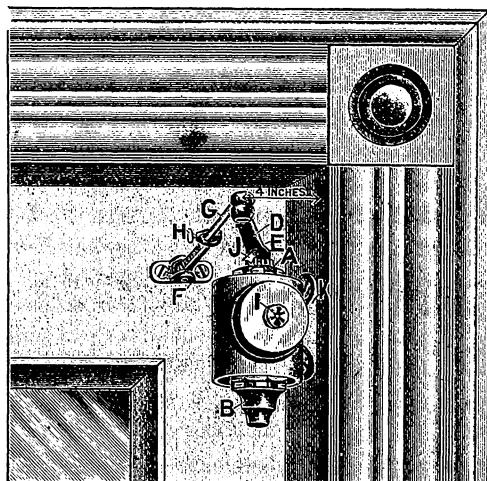
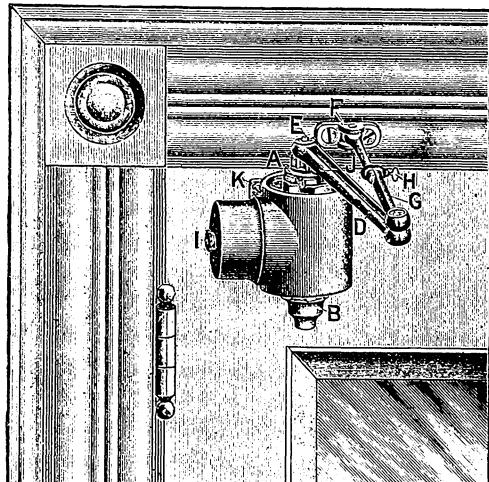
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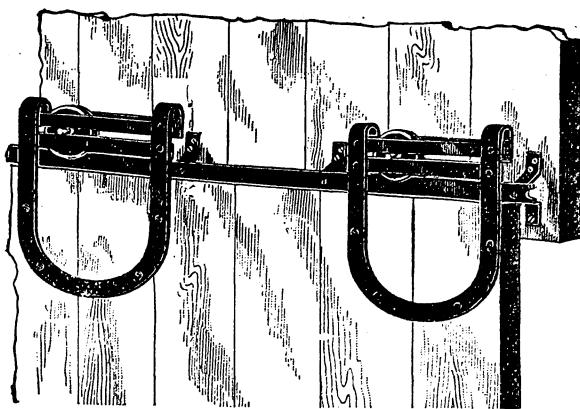


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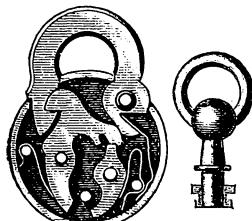
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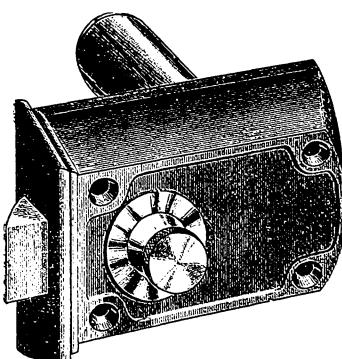
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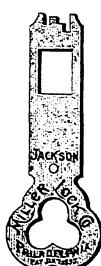


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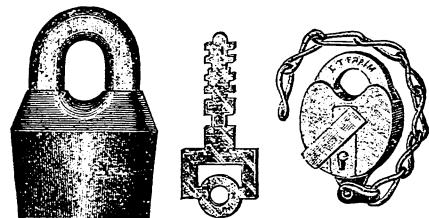
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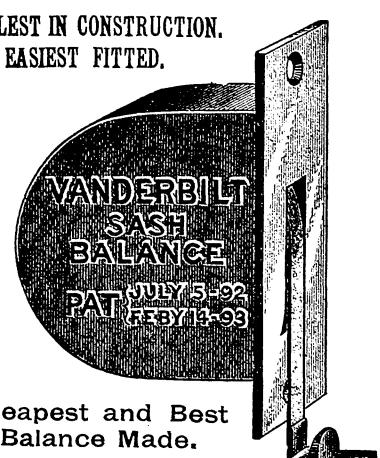
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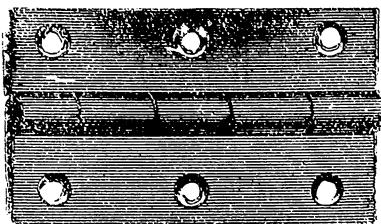
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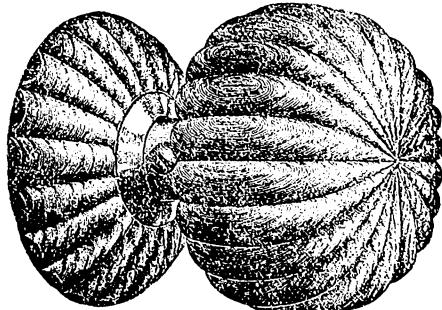
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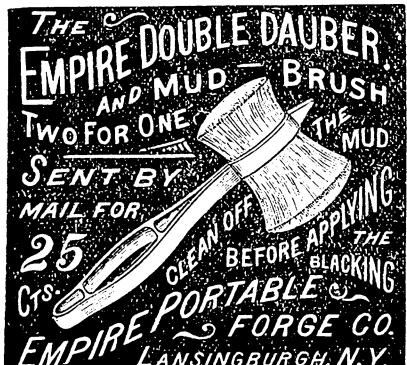
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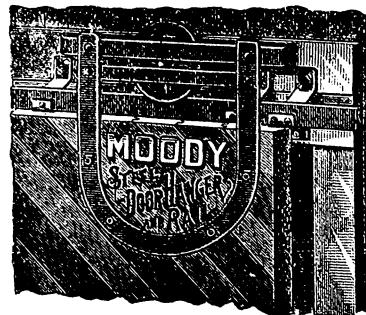
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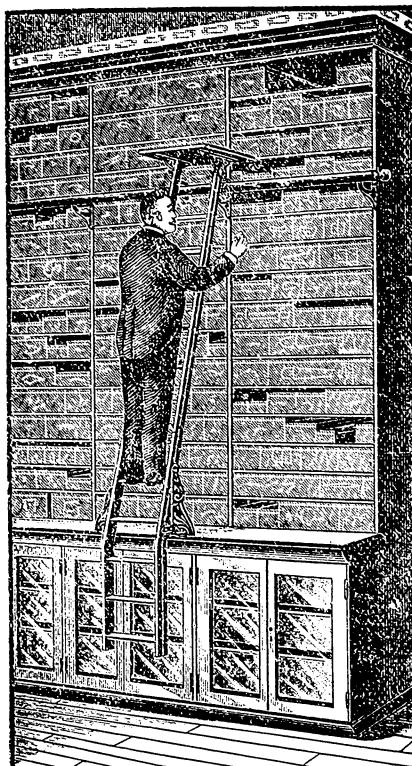
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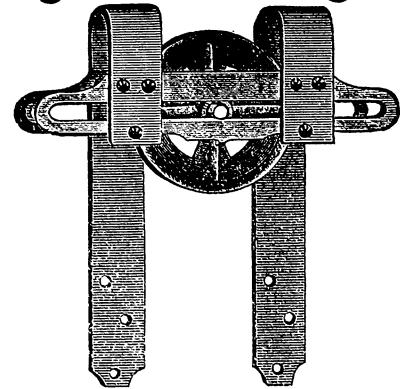
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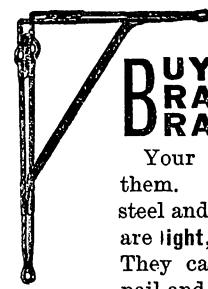
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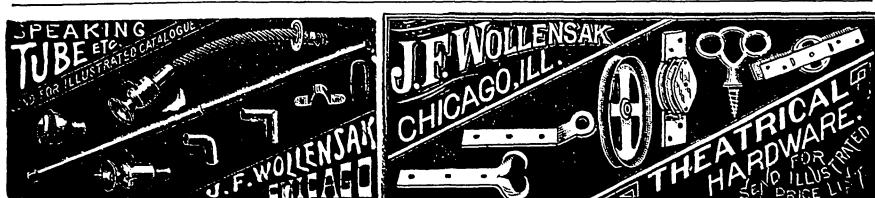
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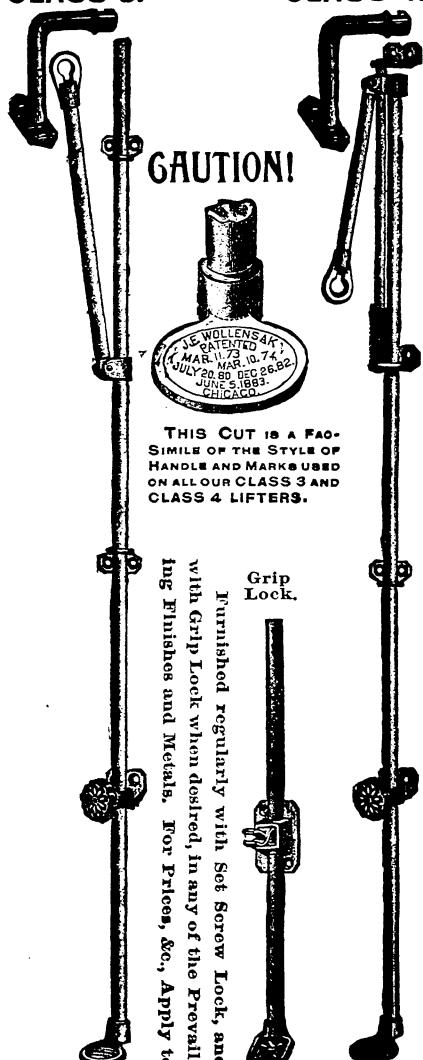
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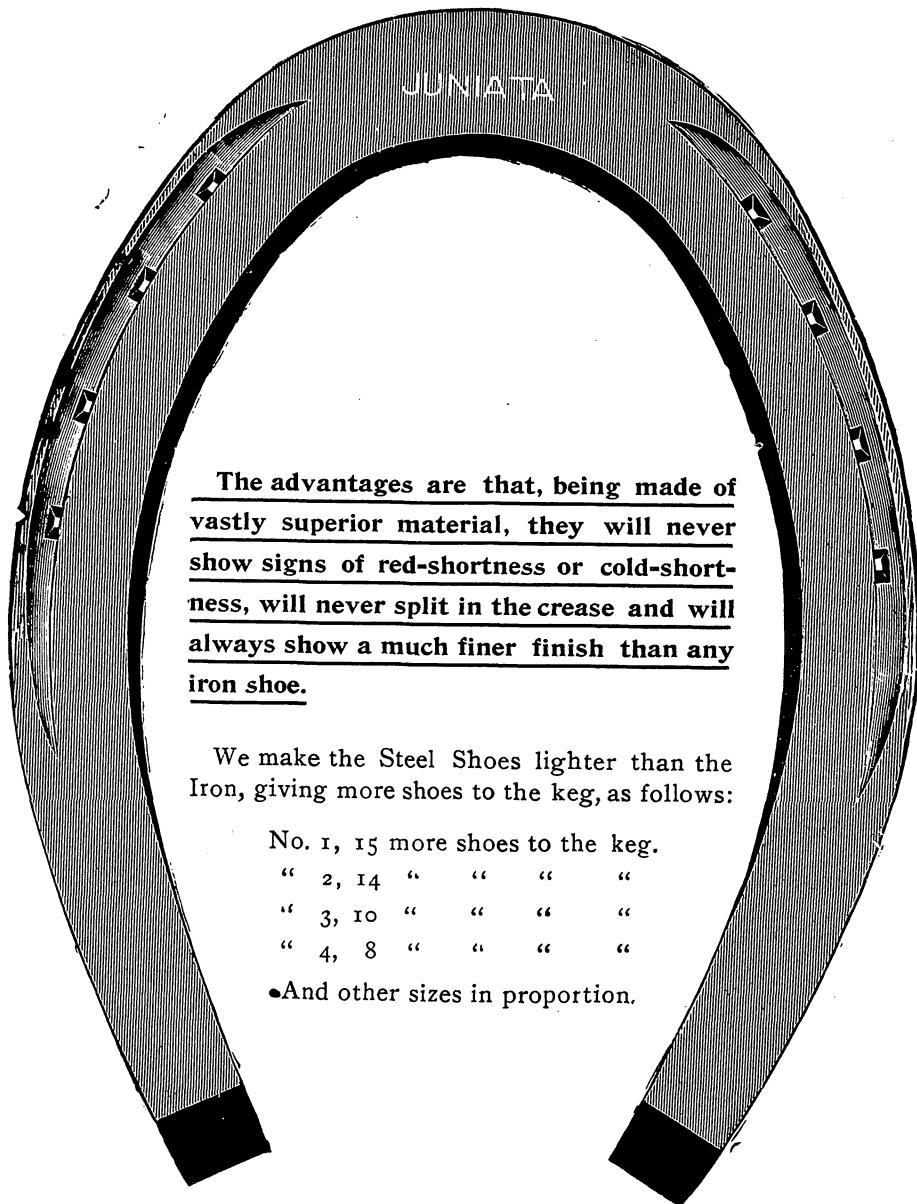


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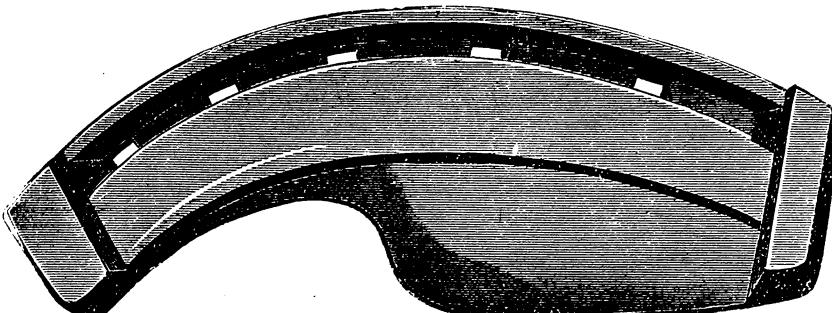
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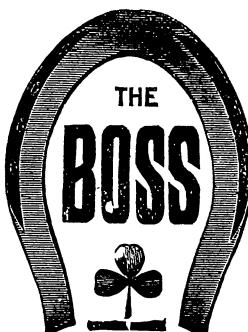
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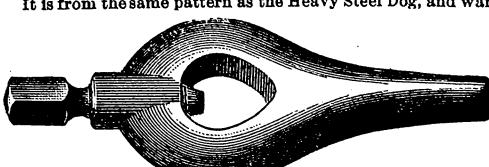
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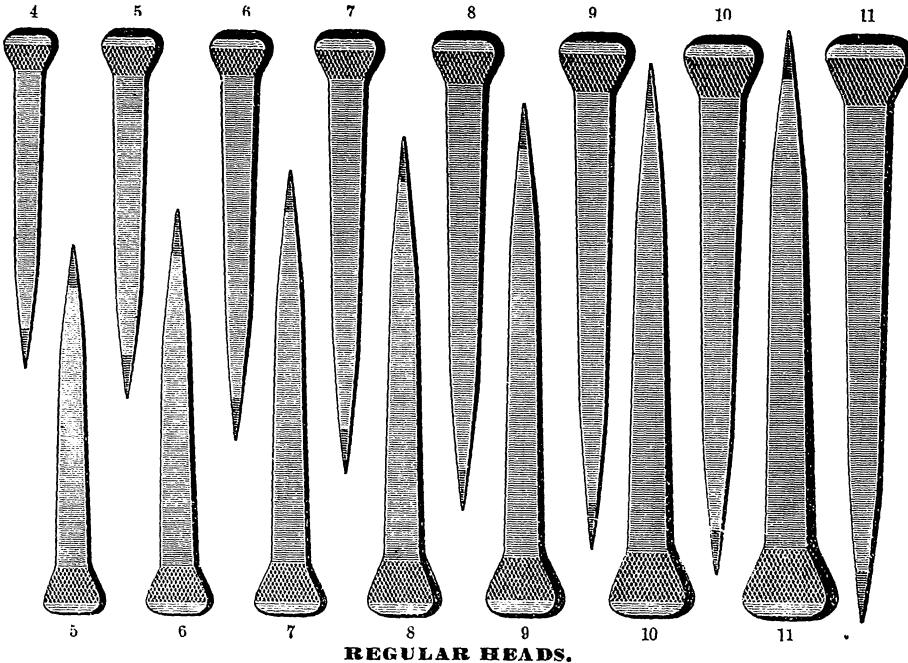
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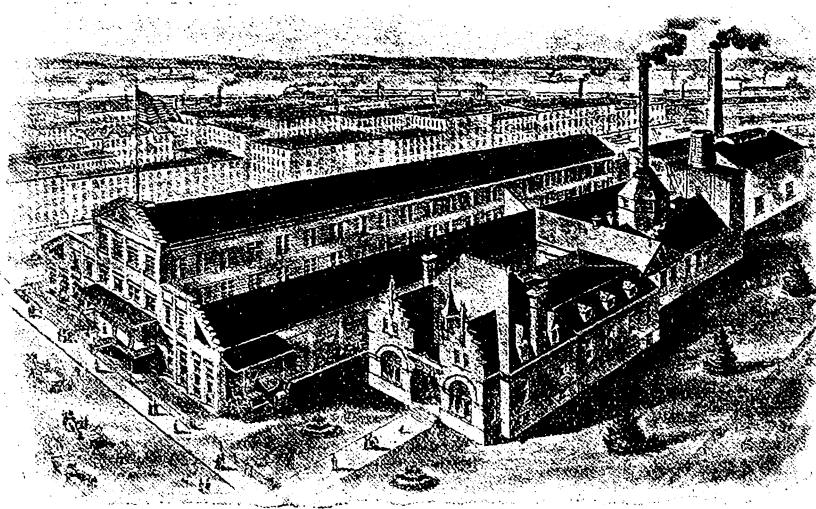
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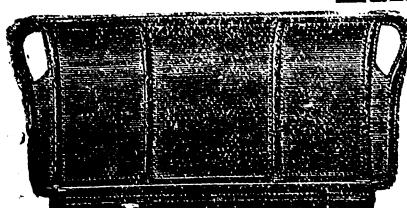
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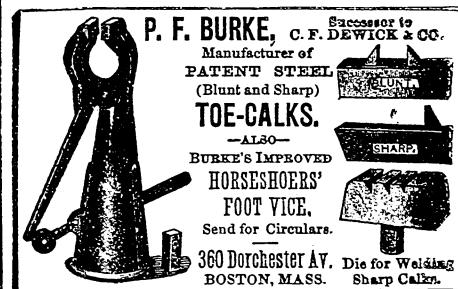
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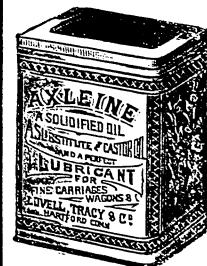


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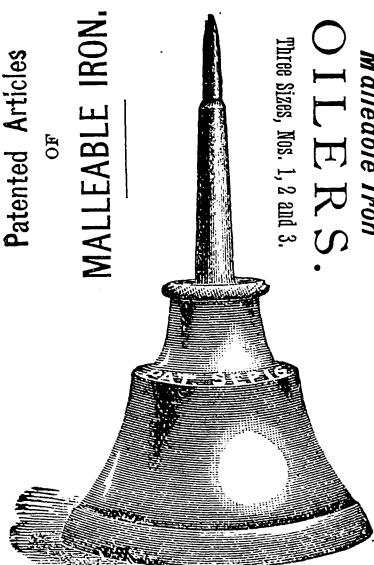
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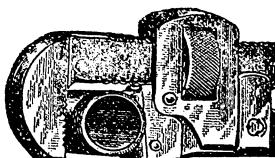
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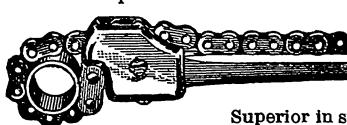
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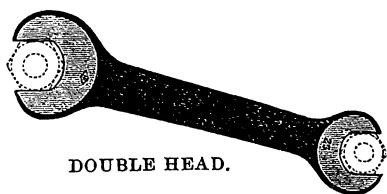
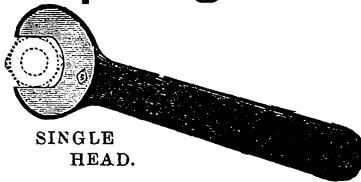
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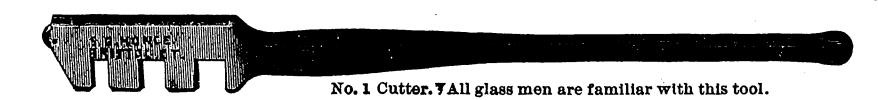
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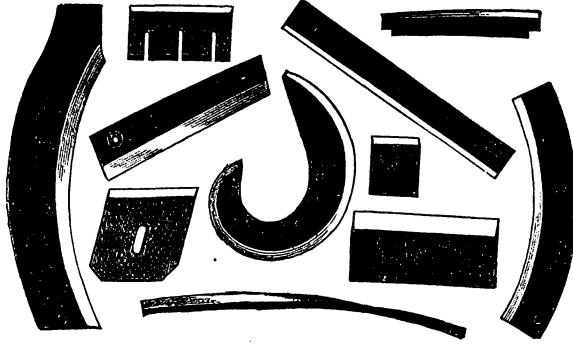
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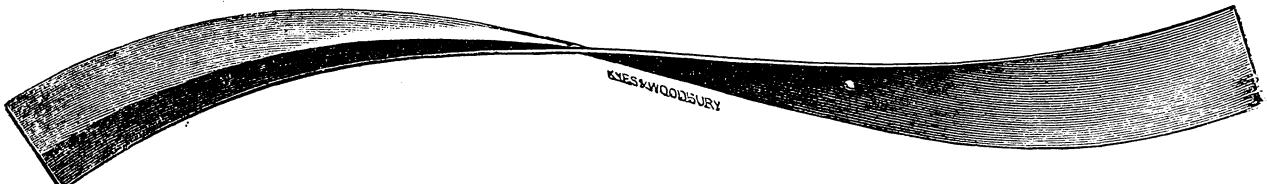
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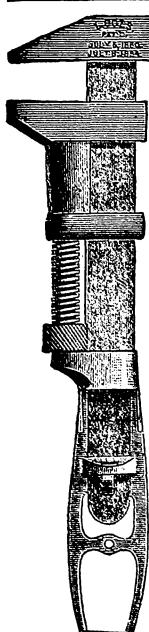


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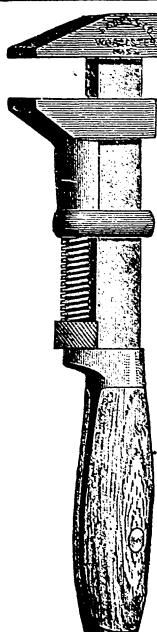
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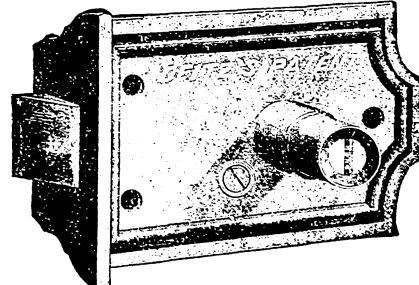
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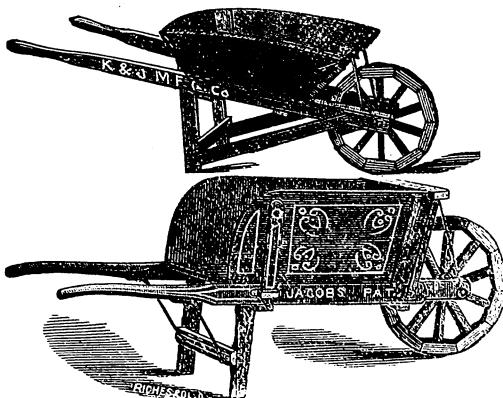
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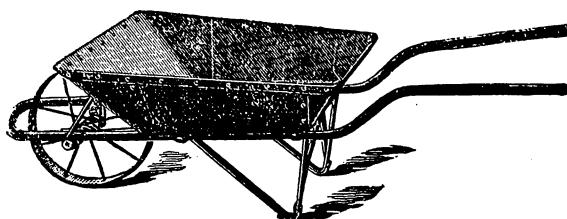
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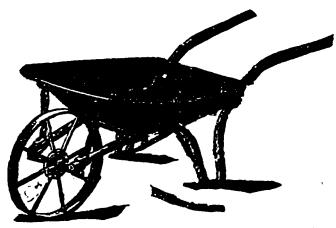
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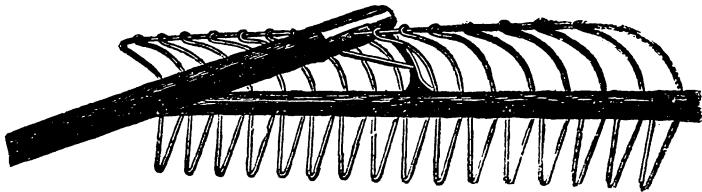


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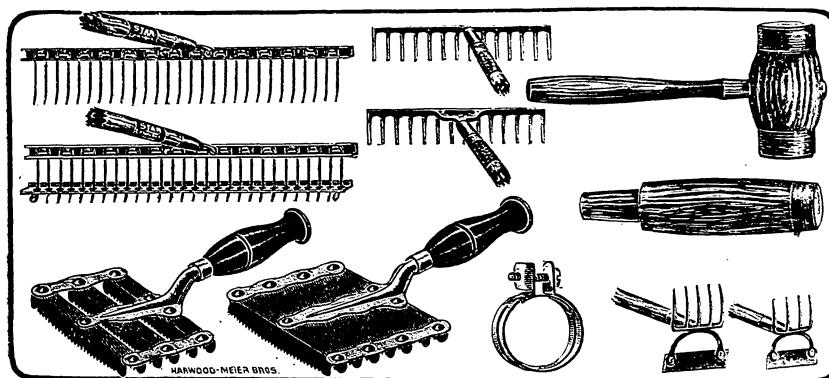
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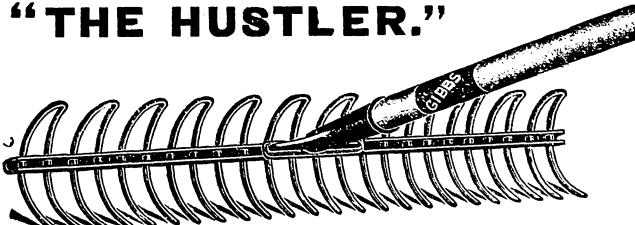
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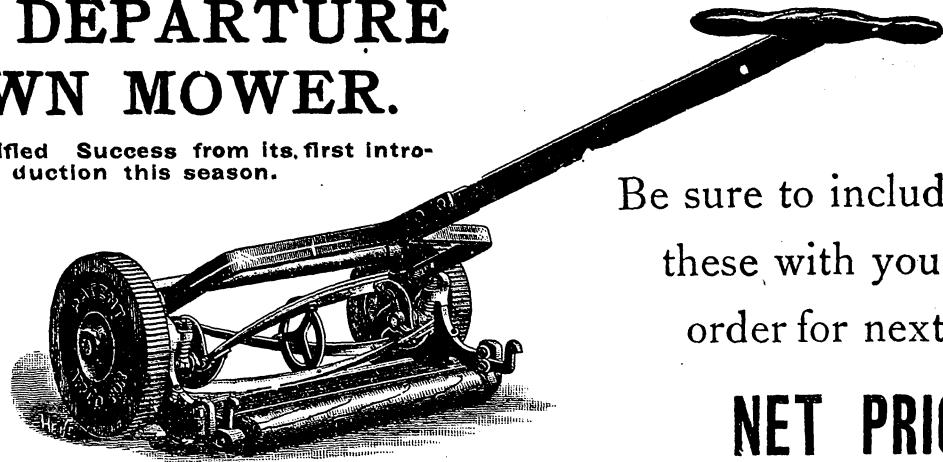
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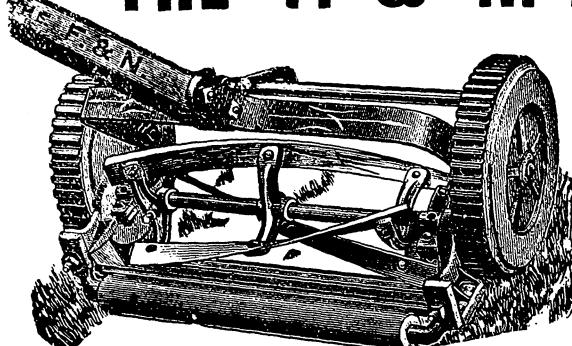
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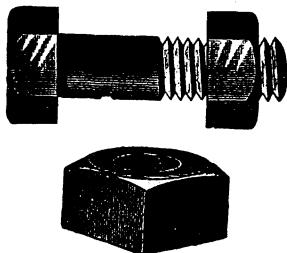


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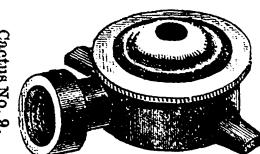
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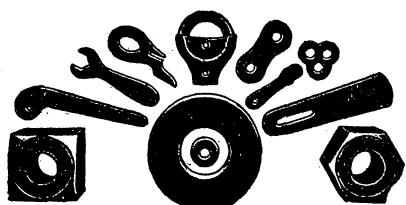
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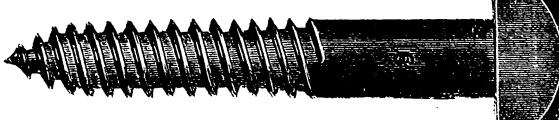
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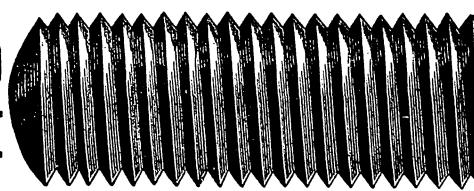
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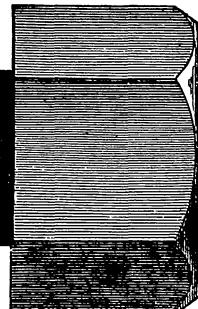
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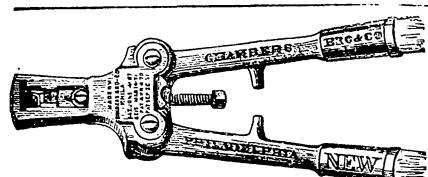


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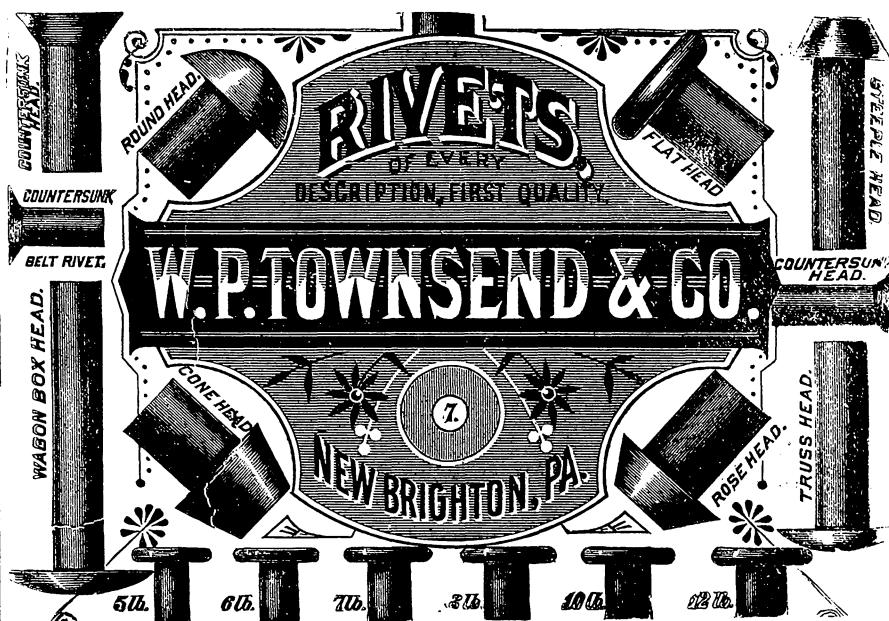
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Air Moving Machinery. Howard & Morse, 45 Fulton, N. Y.	Car Axles. Roberts, A. & P. & Co., Phila.	Cork Screws. Williamson, C. T. Wire Novelty Co., Newark, N. J.	
Aluminum. Illinois Pure Aluminum Co., Lemont Ill. Pittsburgh Reduction Co., Pittsburgh. Scovill Mfg. Co., Waterbury, Conn.	Carboy Stands. Hillebrand & Wolf, Philadelphia, Pa.	Corrugated Furnaces. Continental Iron Wks., Brooklyn, N. Y.	
Aluminum, Brass and Bronze. Gaylord, F. L. Co., Ansonia, Conn. Haight & Clark, Albany, N. Y. St. Louis Bronze & Aluminum Works, St. Louis, Mo.	Car Wheels. Whitney, A. & Sons, Phila.	Corrugated Iron. Cambridge Roofing Co., Cambridge, O. Cincinnati Corrugating Co., Piqua, O. Moseley Iron Bridge & Roof Co., 5 Dey N. Y.	
Analytical Chemists. Britton, J. Blodgett, Philadelphia, Pa. Hunt, Robt. W. & Co., Chicago, Ill. Moore, Dr. Gideon E., 221 Pearl St., N. Y.	Carriage Hardware, Makers of. Cover's Saddlery Works, Farmer, N. Y. Eccles, Richard, Auburn, N. Y. McKinnon Dash & Hdw. Co., Ltd., Buffalo, N. Y. Scranton Forging Co., Scranton, Pa. Smith, H. D. & Co., Planterville, Conn. Wilcox & Howe Co., Birmingham, Conn.	Counting Machines. Durant, W. N., Milwaukee, Wis. Osborn, G. Edw. & Co., New Haven, Ct.	
Anti-Friction Metals.—See Babbitt Metal.	Cartridge Reloading Tools. Ideal Mfg. Co., New Haven, Conn.	Coupling. Almond, T. R., Brooklyn, N. Y.	
Anvil and Vise (Combination). Fulton Iron & Engine Works, Detroit, Mich.	Casters, Wheel & Co. Clark, G. P., Windsor Locks, Conn.	Coverings, Beller and Pipe. Johns, H. W. Mfg. Co., 87 Maiden Lane.	
Anvils. Eagle Anvil Works, Trenton, N. J. Wright, Peter & Sons, Dudley, Eng.	Castings, Iron and Steel. Ames Sword Co., Chicopee, Mass. Arcade Malleable Iron Co., Worcester Mass.	Cranes. Detroit Foundry Equipment Co., Detroit, Mich.	
Apple Parers. Goodell Co., Antrim, N. H.	Booth, The Lloyd, Co., Youngstown, O. Burgess & Loxley, Buffalo, N. Y. The Burr & Houston Co., Brooklyn, N. Y. Cambria Steel—Cambria Iron Co., Johnstown, Pa. Cheney, S. & Son, Manlius, N. Y. Chester Steel Casting Co., Phila. Chrome Steel Works, Brooklyn, N. Y. Dayton Malleable Iron Co., Dayton, O. Erie & Henger Mfg. Co., St. Louis, Mo. Eureka Cast Steel Co., Chester, Pa. Flagg, Stanley G. & Co., Phila. Garland Foundry Co., Cleveland, O. Haight & Clark, Albany, N. Y. Hammer & Co., Branford, Conn. Herrick, J. A., 234 Pearl St., N. Y. Johnson, I. G. & Co., Spuyten Duyvil. Mahoning Fdry & Mch. Co., Danville, Pa. Palmer & De Mooy, Cleveland, O. Sessions Foundry Co., Bristol, Conn. Spencer's, J. S., Sons, Guilford, Conn. Standard Fdy. & Mfg. Co., Cleveland, O. Standard Steel Casting Co., Thurlow, Pa.	Cupolas, Hot-Blast. Byram & Co., Detroit, Mich. Collis, Victor, Detroit, Mich. Detroit Fdry. Equipment Co., Detroit, Mich.	
Architects. Bissell, E. Son & Co., N. Y.	Books. Marine Review, Cleveland, Ohio. Williams, David, 96-102 Reade N. Y. Wolcott & West, Syracuse, N. Y.	Cutlery Cases. Torrey, J. R. & Co., Worcester, Mass.	
Axes. Peck, A. G. & Co., Cohoes, N. Y.	Boxes, Hdw. Shelf, &c. Green, A. H., 22 Park Place, N. Y. Jones, Jesse & Co., Philadelphia, Pa.	Cutlery, Importers of. Field, Alfred & Co., 98 Chambers St., New York. Gurney, Fred B., 116 Chambers St., N. Y. Sickle, Sweet & Lyon, 35 Barclay, N. Y.	
Axle Grease. Lovell, Tracy & Co., Hartford, Conn.	Box Straps and Corners. Buffalo Specialty Mfg. Co., Buffalo, N. Y.	Cutlery, Manufacturers of. Bingham, W. Co., Cleveland, Ohio. Dame, Stoddard & Kendall, Boston Mass.	
Axles, Springs, &c., Makers of. Gautier Steel Dept. of Cambria Iron Co., Johnstown, Pa. Wurster, F. W. & Co., Brooklyn, N. Y.	Brackets. Atlas Mfg. Co., New Haven, Conn.	Electric Cutlery Co., 113 Chambers, N. Y. Goodell Co., Antrim, N. H. Northampton Cutlery Co., Northampton, Mass. Schmactenberg Bros., 98 Chambers Street, N. Y. Wilson, John, Sheffield, England.	
Babbitt Metal. Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn. Crown Sheetings Co., Chester, Pa. Hierts, T. & Son, St. Louis, Mo. Keys, W. W. & R. M. Co., Bridgeport, Conn. Reeves, Paul S., Philadelphia, Pa.	Brass, Manufacturers of. Ansonia Brass & Copper Co., N. Y. Davol, John & Sons, 100 John, N. Y. Plume & Atwood Mfg. Co., N. Y. Randolph & Clowes, Waterbury, Conn. Scovill Mfg. Co., Waterbury, Conn. Waterbury Brass Co., 236 B'way, N. Y.	Chains. Bradley & Co., Philadelphia. Bridgeport Chain Co., Bridgeport, Conn. Link-Belt Engineering Co., Phila., Pa. McKay, Jas. & Co., Pittsburgh, Pa.	
Bakers and Roasters. Bronson Supply Co., Cleveland, Ohio.	Brass Butt Hinges. Tiebout, W. & J., 16 & 18 Chambers.	Chimneys. Phila. Engineering Works, Phila., Pa.	
Bale Ties. Kilmer Mfg. Co., Newburg, N. Y.	Brass Founders. Best, Fox & Co., Pittsburgh, Pa. Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.	Chisels, Manufacturers of. Buck Bros., Millbury, Mass. White, L. & J. Co., Buffalo, N. Y.	
Band Saw Machines. Cross & Speirs Machine Co., Waterbury, Conn.	Bridge Builders. Berlin Iron Bridge Co., East Berlin, Ct. Boston Bridge Works, Boston, Mass. Wrought Iron Bridge Co., Canton, O.	Chucks. Cushman Chuck Co., Hartford, Conn. Smith & Egge Mfg. Co., Bridgeport.	
Barb Wire and Fence. Consolidated Steel & Wire Co., St. Louis, Mo. Gautier Steel Dept. of Cambria Iron Co., Johnstown, Pa. Indiana Wire Fence Co., Crawfordsville, Ind. Kilmer Mfg. Co., Newburg, N. Y. Ludlow-Saylor Wire Co., St. Louis, Mo. Washburn & Moen Mfg. Co., Worcester.	Bronze Goods. Brass Goods Mfg. Co., 88 Chambers.	Clamps. Hammer & Co., Branford, Conn. Le Count, C. W., So. Norwalk, Conn.	
Bear Iron. Manufacturers of. Ains-Standard Iron & Steel Co., Bridgeport, Ct. Allentown Rolling Mill, Allentown, Pa. Burden Iron Co., Troy, N. Y.	Bridge Builders. Berlin Iron Bridge Co., East Berlin, Ct. Boston Bridge Works, Boston, Mass. Wrought Iron Bridge Co., Canton, O.	Clipping Machines. Hotchkiss, E. S., Bridgeport, Conn. McCoy, Jos. F. & Co., 28 Warren St.	
Bellows, Manufacturers of. Bullock Bellows Co., Cleveland, O. Scott, Geo. M., Chicago, Ill.	Brouze (Tobin). Ansonia Brass & Copper Co., 19-26 Cliff Street, N. Y.	Coal. Barns, C. K. & Co., Philadelphia, Pa. Wister, Francis, Philadelphia, Pa.	
Bells. Eevin Bros. Mfg. Co., East Hampton.	Builders' Hardware. Corbin, P. & F., New Britain, Conn. Deitz, A. B., 97 Chambers St., N. Y. Reading Hdw. Co., Reading, Pa.	Coke. Barns, C. K. & Co., Philadelphia, Pa. Houston, C. B. & Co., Philadelphia, Pa. Rainey, W. J., Cleveland, O. Sibell, Geo. H. & Co., Chicago, Ill. Wister, Francis, Philadelphia, Pa.	
Belt Dressing. Jos. Dixon Crucible Co., Jersey City, N. J.	Butchers' Steels. Chatillon, John & Sons, 85-89 Cliff St., N. Y. Hoffman, C. & A., Philadelphia, Pa.	Collections. Hardware Board of Trade (Limited) 4 and 6 Warren, N. Y.	
Belt Fasteners. Bristol's Mfg. Co., Waterbury, Conn. Claffen Mfg. Co., Cleveland, Ohio. Talcott, W. O., Providence, R. I.	Butcher and Shoe Knives, Manufacturers of. Chatillon, John & Sons, 85-89 Cliff St., N. Y. Goodell Co., Antrim, N. H. Wilson, John, Sheffield, England.	Condensers. Worthington, Henry R., 86 & 88 Liberty Street, N. Y.	
Bolting, Makers of. Alexander Bros., 42 N. 3d, Phila. Jeffrey Mfg. Co., Columbus, O. Link-Belt Engineering Co., Phila., Pa. Main Beltling Co., Philadelphia, Pa. N. Y. Beltling & Packing Co., Ltd., N. Y. Roberts Mfg. Co., Pittsburgh, Pa. Shultz Beltling Co., St. Louis, Mo.	Butts and Hinges. McKinley Mfg. Co., Allegheny, Pa. Sabin Machine Co., Montpelier, Vt.	Conveying Machinery. Brown Holting & Conveying Machine Co., Cleveland, Ohio. Jeffrey Mfg. Co., Columbus, O. Link Belt Engineering Co., Phila., Pa.	
See Alphabetical Index, Pages 95 & 96.		Copper. Ames Sword Co., Chicopee, Mass. Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y. Hendricks Bros., 49 Cliff, N. Y. New Haven Copper Co., 294 Pearl, N. Y. Randolph & Clowes, Waterbury, Conn. Wister, Francis, Philadelphia, Pa.	
		Drop Forgings. Beuken Mfg. Co., New Haven, Conn. Billings & Spencer Co., Hartford, Conn. Boone, W. C. Mfg. Co., Boonton, N. J. Eccles, Richard, Auburn, N. Y. Herbrand Co., Fremont, O. Merrill Bros., Brooklyn, N. Y. Miner & Peck Mfg. Co., New Haven, Ct. Phila. Drop Forge Co., Philadelphia, Pa. Scranton Forging Co., Scranton, Pa. Spiers, J. C. & Co., Worcester, Mass. Williams, J. H. & Co., Brooklyn, N. Y. Wilmot & Hobbs Mfg. Co., Bridgeport, Conn. Wyman & Gordon, Worcester, Mass.	
		Drop Presses. Bissell, E. W. Co., Brooklyn, N. Y. Crosby, G. A. & Co., Chicago, Ill.	

Miner & Peck Mfg. Co., New Haven Conn.
Stiles & Parker Press Co., Brooklyn, N. Y.
Vulcan Iron Works, Chicago, Ill.
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

Dumb Waiters.
Storm Mfg. Co., Newark, N. J.

Dust Beaters.
Peabody & Parks, Troy, N. Y.

Dynamite.
New York Powder Co., 62 Liberty St. N. Y.

Dynamos.
C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
Lovel Mfg. Co., Ltd., Erie, Pa.
Zucker & Levertt Chemical Co., 10 & 12 Grand St., N. Y.

Edge Tools.
Stock Bros., Millbury, Mass.
Buffalo Edge Tool Wks., Buffalo, N. Y.
Plumb, Fayette R., Philadelphia, Pa.
White, L. & J. Co., Buffalo, N. Y.

Egg Beaters.
North Bros. Mfg. Co., Philadelphia.

Electric Bells and Supplies.
Ostrander, W. R. & Co., 204 Fulton St., New York
Wollensak, J. F., Chicago, Ill.

Electric Dynamo Machines.
Colburn Electric Mfg. Co., Fitchburg, Mass.
Eddy Electric Mfg. Co., Windsor, Conn.

Electric-Platers.
Boardman, L. & Son, East Haddam, Ct.

Elevators. Makers of.
Link-Belt Engineering Co., Phila., Pa.
Morse, Williams & Co., Phila., Pa.
Salem Fdry & Mch. Co., Salem, Mass.

Emery and Emery Wheels.
Bell, Geo. E., 36 John St., N. Y.
Grant Corundum Wheel Mfg. Co., Worcester, Mass.
N. Y. Belting & Packing Co., Ltd., N. Y.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.

Enamels.
Nubian Iron Enamel Co., Cragin, Ill.

Engineers and Contractors.
Aiken Henry, Pittsburgh, Pa.
Artificial Gas Engineering Co., Pittsburgh, Pa.
Herrick, J. A., 284 Pearl St., N. Y.
Kennedy, Julian, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa.
Lean, D. R., Co., Pittsburgh, Pa.
McClure, Amster & Co., Pittsburgh, Pa.
Pittsburgh Iron & Steel Engineers Co., Pittsburgh, Pa.
Roberts, Frank C., Philadelphia, Pa.
Smythe, S. R. Co., Incorporated Pittsburgh, Pa.
Swindell, W. & Bros., Pittsburgh, Pa.
Witherow, Jas. P. Co., Pittsburgh, Pa.

Engines, Gas.
Otto Gas Engine Works, Phila., Pa.
Rollason Gas Engine, Havemeyer Bldg., N. Y.

Engines. Steam. Makers of.
Bass Foundry & Machine Works, Ft. Wayne, Ind.
Buckeye Engine Co., Salem, O.
Erie Engine Works, Erie, Pa.
Harrisburg Fdy. & Machine Works, Harrisburg, Pa.
Norwalk Iron Works Co., So. Norwalk, Conn.
Penn. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Phila. Engineering Works, Phila., Pa.
Phoenix Iron Wks. Co., Meadville, Pa.
Shipman Engine Co., Boston, Mass.
Southwark Foundry and Machine Co., Phila., Pa.
Tod, William & Co., Youngstown, O.
Wetherill, Robt. & Co., Chester, Pa.

Exhaust Tumblers.
Sweetser, W. A., Brockton, Mass.

Expansion Bolts.
Boone, W. C. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O.

Faucets, Self-Measuring.
Lane Bros., Poughkeepsie, N. Y.

Faucets, Wooden. Makers of.
Boston & Lockport Block Co., Boston, Mass., and Lockport, N. Y.
John Sommer's Son, Newark, N. J.

Feed-Water Heaters.
Davis, I. B. & Son, Hartford, Conn.
Gonbert Mfg. Co., 32 Cortlandt St., N. Y.
Harrison Safety Boiler Wks. Phila., Pa.
National Pipe Bending Co., New Haven, Conn.
Webster Warren & Co., Camden, N. J.
Whitlock Coll Pipe Co., Elmwood, Conn.

Fencing, Iron and Wire.
Barraun, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Clinton Wire Cloth Co., Clinton, Mass.
Gilbert & Bennett Mfg. Co., 42 Cliff St., Hartman Mfg. Co., Ellwood City, Pa.
Kilmer Mfg. Co., Newburgh, N. Y.
Mast, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.
Bellance Wire & Iron Wks., Milwaukee, Wis.

Files, importers of.
Moss, F. W., 80 John, N. Y.

Files and Rasps, Manufacturers of.
Arcade File Works, Anderson, Ind.
Bunker & White, Troy, N. Y.

Barnett, G. & H., 41 & 48 Richmond Phila.
McCaffrey File Co., Philadelphia.
Nicholson File Co., Providence, R. I.

Fire Brick, Makers of.
Borgner, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer B. Sons, Foot E., Houston, St.
McLeod & Henry Co., Troy, N. Y.
Maurer, H., & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Valentine, M. D. & Bro., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Fishing Tackle.
Dame, Stoddard & Kendall, Boston, Mass.

Flint and Emery Paper.
Baeder, Adamson & Co., Phila., Pa.

Flue Cleaners.
Mackey, Jas. T., St. Louis, Mo.

Fodder Cutters.
Silver Mfg. Co., Salem, O.

Foreign Periodicals.
Stechert, G. E., 810 Broadway, N. Y.

Forges, Portable, &c.
Bullock Bellows Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.

Empire Portable Forge Co., Lansingburg, N. Y.

Forgings, Iron and Steel.
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel-Cambria Iron Co., Johnstown, Pa.
Scranton Forging Co., Scranton, Pa.

Foundry Facings.
S. O. Bernmayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O.

Foundry Riddles.
Estey, W. S., 65 Fulton, N. Y.

Foundry Supplies.
Colliou, Victor, Detroit, Mich.
Diamond Clamp & Flask Co., Richmond, Ind.

S. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O.

Friction Clutches.
Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.

Friction Cone.
Evans Friction Cone Co., Boston, Mass.

Fruit Presses.
Enterprise Mfg. Co., Philadelphia, Pa.

Furnaces, Foundry.
Byram & Co., Detroit, Mich.

Gas Producers.
Wood, R. D. & Co., Philadelphia, Pa.

Gas & Steam Fitters' Supplies.
Pancoast, Henry B. & Co., Phila., Pa.

Gauge, Rolling Mill.
Haines Gauge Co., Philadelphia, Pa.

Gear Cutters.
D. E. Whiton Mach. Co., New London, Conn.

Gears.
Boston Gear Works Boston, Mass.
Poole, Robt. & Son Co., Baltimore, Md.

Glass Boards.
Canton Saw Co., Canton, O.

Glass Cutters.
Monce, S. G., Bristol, Conn.

Glass Tubes.
Ashcroft Mfg. Co., 111 Liberty St., N. Y.

Glue.
Baeder, Adamson & Co., Phila., Pa.

Russia Cement Co., Gloucester, Mass.

Grass Catchers.
Supplee Hardware Co., Phila., Pa.

Grass Hooks.
Bruce & Marks Mfg. Co., Gas City, Ind.

Grinding Mills.
Foos Mfg. Co., Springfield, O.

Grinding and Polishing Machines.
Norton Emery Wheel Co., Worcester, Mass.

Grindstones.
Cleveland Stone Co., Cleveland, O.

Gunpowder, Makers of.
Lafin & Rand Powder Co., 29 Murray St., N. Y.

Hand Carts.
Lansing Wheelbarrow Co., Lansing, Mich.

Handles.
New York Mallet and Handle Wks., 456 E. Houston St., N. Y.

Hangers, Door.
Chicago Spring Butt Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Lane Bros., Poughkeepsie, N. Y.
Victor Mfg. Co., Newburyport, Mass.

Hardware Comm'n Merchants.
Doscher, Martin, 88 Chambers, N. Y.
Field, Alfred & Co., 98 Chambers St., N. Y.
Graham, John H. & Co., 111 Chambers St., New York.
Jacobus, W. H., 90 Chambers, N. Y.

Hardware Manufacturers.

Hotchkiss, E. S., Bridgeport, Conn.

Stearns, E. C. & Co., Syracuse, N. Y.

Union Mfg. Co., 103 Chambers, N. Y.

Yale & Towne Mfg. Co., Stamford, Conn.

Hardware Mfrs. Agents.

Bingham, W. Co., Cleveland, O.

Graham, John H. & Co., 118 Chambers

McCoy, Jos. F. Co., 28 Warren St., N. Y.

Sickler, Sweet & Lyon, 38 Barclay, N. Y.

Underhill, Clinch & Co., 94 Chambers St., N. Y.

Hardware Specialties.

Acme Shear Co., Bridgeport, Conn.

Balden Machine Co., New Haven, Conn.

Empire Portable Forge Co., Lansingburg, N. Y.

Enterprise Mfg. Co., Philadelphia, Pa.

Ette & Henger Mfg. Co., St. Louis, Mo.

Haines & Zimmerman, Phila., Pa.

Hill, H. C. Mfg. Co., Detroit, Mich.

Johnson, S. C., Racine, Wis.

Knapp & Cowles Mfg. Co., Bridgeport, Conn.

North Bros. Mfg. Co., Philadelphia, Pa.

Peabody & Parks, Troy, N. Y.

Weiland, Chas., 119 Chambers St., N. Y.

Wilson, J. Fred., Worcester, Mass.

Underhill, Clinch & Co., 94 Chambers Street, N. Y.

Hardware Yacht and Ship.

Ferdinand, L. W. & Co., Boston, Mass.

Harness Snaps.

Cover Mfg. Co., West Troy, N. Y.

Cover's Saddlery Wks., Farmer, N. Y.

Fitch, W. & E. T., New Haven, Conn.

Hay Knives.

Bruce & Marks Mfg. Co., Gas City, Ind.

Holt, Hiram, Co., E. Wilton, Me.

Hoisting Machines.

Box, Alfred & Co., 814 Green, Phila.

Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.

Fulton Iron & Engine Wks., Detroit, Mich.

Friction Clutches.

Harrington, E., Son & Co., Phila.

Lane Bros., Poughkeepsie, N. Y.

Lidgerwood Mfg. Co., 98 Liberty, N. Y.

Maris & Beeley, Philadelphia.

Moore Mfg. & Fdy. Co., Milwaukee, Wis.

Morse, Williams & Co., Phila.

Sellers, Wm. & Co., Phila., and N. Y.

Speidel, J. G., Reading, Pa.

Yale & Towne Mfg. Co., Stamford, Ct.

Hollow Ware.

Bronson Supply Co., Cleveland, Ohio.

Cleveland Stamping & Tool Co., Cleveland, O.

Stuart & Peterson Co., Phila., Pa.

Hollow Ware, Aluminum.

Illinois Pure Aluminum Co., Lemont, Ill.

Horse and Barbers' Clippers.

Hotchkiss, E. S., Bridgeport, Conn.

Horse Nails, Makers of.

Caowell Horse Nail Co., Hartford, Conn.

National Horse Nail Co., Vergennes, Vt.

Horse and Mule Shoes. Makers of.

Bryden Horse Shoe Co., Catasauqua, Pa.

Burden Iron Co., Troy, N. Y.

Crescent Horse Shoe & Iron Co., Max Meadows, Va.

Diamond State Iron Co., Wilmington, Del.

Old Dominion Iron & Nail Works Co., Richmond, Va.

Phoenix Horse Shoe Co., Poughkeepsie, N. Y.

Rhode Island Perkins Horse Shoe Co., Providence.

Shoenberger & Co., Pittsburgh, Pa.

Standard Horse Shoe Co., Boston, Mass.

Hose.

Cleveland Rubber Works, Cleveland, O.

N. Y. Belting & Packing Co., 16 Park Row, N. Y.

Hydrants, &c.

McLean, John, 296 & 298 Monroe, N. Y.

Hydraulic Jacks.

Dudgeon, Richard, 24 Columbia, N. Y.

Watson & Stillman, 204 E. 43d, N. Y.

Ice-Cream Freezers.

North Bros. Mfg. Co., Phila., Pa.

Packer, C. W., Philadelphia, Pa.

White Mountain Freezer Co., Nashua, N. H.

Ice Shavers.

Enterprise Mfg. Co., Philadelphia, Pa.

Injectors.

Eynon-Evans Mfg. Co., Philadelphia, Pa.

Jenkins Bros., New York

Insurance, Boiler.

Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

Letter and Figures, Metallic.

White, A. A. & Co., Providence, R. I.

Letters, Paper.

Tablet & Ticket Co., Chicago, Ill.

Levels.

Davis & Cook, Watertown, N. Y.

Richardson, C. F., & Son Athol, Mass.

Locks & Knobs, Manufacturers of.

Deitz, A. E., 97 Chambers, N. Y.

Keyless Lock Co., Chicago, Ill.

Reading Hdw. Co., Reading, Pa.

Smith & Egge Mfg. Co., Bridgeport, Conn.

Yale & Towne Mfg. Co., Stamford, Conn.

Iron and Steel, Swedish.

Lundberg, Gustaf, Boston, Mass.

Milne, A. & Co., 1 Broadway, N. Y.

Iron Commission Brokers.

Corning Edw. & Co., 29 B'way, N. Y.

Cotton, Bradley & Co., Philadelphia.

Etting, Edw. J., Philadelphia.

Hogan, John L. & Co., Philadelphia.

Hoffman, J. W. & Co., Philadelphia.

Levis, Henry & Co., Philadelphia.

Keiley, Jerome & Co., Philadelphia.

Lea, J. Tatman & Co., Philadelphia.

Mohr, J. J., 430 Walnut, Philadelphia.

Pilling & Crane, Philadelphia, Pa.

Sibley, Geo. H. & Co., Chicago, Ill.

Wister, L. & R. & Co., Phila., Pa.

Iron Ore.

Naylor & Co., 45 Wall, N. Y.

Pulman, J. Wesley, Phila., Pa.

Samuel, Frank, Philadelphia, Pa.

Iron, Merchants.

Barnes, O. K. & Co., Philadelphia, Pa.

Borden & Lovell, 70 West, N. Y.

Bussinus & Cunlife, Philadelphia.

Corning Edw. & Co., 29 B'way, N. Y.

Cox, Justice, Jr., Philadelphia.

Cotton, Bradley & Co., Philadelphia.

Hoffman, J. W. & Co., Philadelphia.

Leonard

Machinery.

Am. Tool Works, Cleveland, Ohio.
Barnes, W. F. & John, Rockford, Ill.
Bement, Miles & Co., Philadelphia, Pa.
Bigelow, C. H., 45 Dey, N. Y.
Bignal & Keeler Mfg. Co., St. Louis.
Birmingham Iron Foundry, Birmingham, Conn.
Bliss, E. W. Co., Brooklyn, N. Y.
Bogert, Jno. L., Flushing, N. Y.
Briggs, Marvin, 12 Broadway, N. Y.
Carlin's Sons, Sons, Allegheny, Pa.
Cinn. Milling Mch. Co., Cincinnati, Ohio.
Clapp, Geo. M., agt. 74 Cortlandt, N. Y.
Coulter & McKenzie Mch. Co., Bridgeport, Conn.
Derrick & Harvey Mch. Co., Baltimore, Md.
Fitchburg Mch. Works, Fitchburg, Mass.
Garvin Mch. Co., Laight & Canal Sts., Gould & Eberhardt, Newark, N. J.
Hamilton Mch. Tool Co., Hamilton, O.
Harrington, E. Son & Co., Phila. Pa.
Henderer, A. L., Wilmington, Del.
Hendey Machine Co., Torrington, Ct.
Hill, Clarke & Co., Boston, Mass.
Johnson, Israel H., Jr., & Co., Phila.
Jones & Laison Mch. Co., Springfield, Vt.
Lodge & Shipley Mch. Tool Works, Cincinnati, O.
Lovegrove & Co., Philadelphia, Pa.
McCabe, J. J., 68 Cortlandt, N. Y.
Machinists Supply Co., Rochester, N. Y.
Mahonville, E. J. Mch. Co., Waterbury, Conn.
Newark Mch. Tool Works, Newark, N. J.
New Haven Mch. Co., New Haven, Conn.
New York Mch. Depot, N. Y.
Niles Tool Wks., 138 Liberty St., N. Y.
Pittsburgh Mch. Co., Pittsburgh, Pa.
Poele, Robt. & Son Co., Baltimore, Md.
Power Planer Co., Worcester, Mass.
Pratt & Whitney Co., Hartford, Conn.
Scranton Tool & Supply Co., N. Y.
Scientific Tool & Mchry. Co., Scranton, Pa.
Seller, Wm. & Co., Phila.
Seydel's Sons L. F., Philadelphia, Pa.
Stephens, J. & Co., Cincinnati, O.
Stow, Flexible Shaft Co., Ed., Phila.
Toomey, Frank, Philadelphia, Pa.
Wetherill, Robert & Co., Chester, Pa.
Wilson, W. A., Rochester, N. Y.

Machinery for Hardware Manufacture.

Adt, Jno. & Son, New Haven, Conn.

Machine Knives.

Loring Coes & Co., Worcester, Mass.
Loyd, John, 558-562 Water St., N. Y.

Machine Tools.—See Machinery.**Machine Work.**

Papping, J., 58th St., & 11th Ave., N. Y.
City.

Machinists' Scales.

Confin & Leighton, Syracuse, N. Y.
Starrett, L. S., Athol, Mass.
Valentine Tool Co., Hartford, Conn.

Machinists' Tools and Supplies.

King, J. M. & Co., Waterford, N. Y.
Sellers, Wm. & Co., Inc., Phila.

Mallets.

N. Y. Mallet & Handle Works, N. Y.

Manufacturing Sites.

Chicago, Milwaukee & St. Paul R. R.,
Chicago, Ill.

Measuring Tapes.

Kaufell & Ester Co., 127 Fulton St., N. Y.
Lufkin Rule Co., Saginaw, Mich.

Meat Cutters and Stuffers.

Enterprise Mfg. Co., Philadelphia, Pa.

Mechanical Instruction.

Correspondence School of Mechanics
Scranton, Pa.

Metals.

Fearing, Wm. S., 100 Chambers, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
Naylor & Co., 45 Wall, N. Y.

Metal Brokers.

American Metal Co., N. Y.

Metallurgists.

Britton J. Blodgett, Phila.

Milling Machines.

Cin. Milling Mch. Co., Cincinnati, Ohio.

Mincing Knives.

Palmer Hdw. Mfg. Co., Troy, N. Y.

Mine Lamps.

Derby, Edw. & Sons Phila. Pa.
Leonard, B. E., Scranton, Pa.

Mining Screens.

Harrington & King Perforating Co.,
Chicago, Ill.

Howard & Morse, 45 Fulton, N. Y.

Mirrors.

Rice, C. F., Chicago, Ill.

Molding Sand.

Obermayer, S. Co., Cincinnati, O.

Motors, Water and Electric.

C. & C. Electric Co., 402 and 404
Greenwich St., N. Y.
Dallett, Thos. H. & Co., Phila., Pa.

Nail Machinery.

Pittsburgh Mfg. Co., Pittsburgh, Pa.

Nails (Cut) and Spikes.

Borden & Lovell, 70 West, N. Y.
Cumberland Nail & Iron Co., Phila.
Oxford Iron Co., St. Louis.
Pottstown Iron Co., Pottstown, Pa.
Riverside Iron Wks., Whealung, W. Va.

Neck Yokes.

Johnson, S. C., Racine, Wis.

Nickel Platers' Supplies.

Colburn Electric Mfg. Co., Fitchburg, Mass.
Eddy Electric Mfg. Co., Windsor, Conn.
Zucker & Levent Chemical Company,
10 to 14 Grand St., N. Y.

Norway Shapes, Rollers of.

Bowland, William & Harvey, Franklin,
Philadelphia, Philadelphia

Novelty Manufacturers.

Franklin, H. H. Mfg., Syracuse, N. Y.

Nut Machines.

Dunham Nut Mch. Co., Unionville, O.

Nuts, Bolts, &c., Makers of.

American Bolt Co., Lowell, Mass.
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Haskell, Wm. H. Co., Pawtucket, R. I.
Mt. Carmel Bolt Co., Mt. Carmel, Conn.
Port Chester Bolt and Nut Co.,
Port Chester, N. Y.

Oilers.

Wilmet & Hobbs Mfg. Co., Bridgeport,
Conn.

Oil Stones.

Pike Mfg. Co., Pike Station, N. H.

Oil Stoves.

Glazier Stove Co., Chelsea, Mich.

Ores.

Winter, Francis, Philadelphia, Pa.

Oil Shoes.

Scranton Forging Co., Scranton, Pa.

Painting.

Morrison, Robt., St. Louis, Mo.
N. Y. Belting & Packing Co., Ltd., N. Y.

Padlocks.

Ames Sword Co., Chicopee, Mass.
Fram, E. T., Lancaster, Pa.
Hillebrand & Wolf, Phila. Pa.
Miller Lock Co., Philadelphia, Pa.

Paint.

Dixon, Jos. Crucible Co., Jersey City, N. J.
Garry Iron & Steel Roofing Co., Cleve-
land, O.

Faint Burners.

Dangler Stove & Mfg. Co., Cleveland, O.

Paint Cans.

Wilmet & Hobbs Mfg. Co., Bridgeport,
Conn.

Patent Solicitors.

Howson & Howson, Phila. & Wash'gton,
Jenner, H. W. T., Washington, D. C.
Stocking, E. B., Washington, D. C.

Perforated Metal.

Clinton Wire Cloth Co., Clinton, Mass.
Harrington & King Perforating Co.,
Chicago, Ill.
Hendrick Mfg. Co., Ltd., Carbondale,
Pa.

Phosphor Bronze.

Phosphor Bronze Smelting Co., Lim-
ited, 613 Arch, Philadelphia.

Phosphor Tin.

Oreagent Phosphorized Metal Co.,
Philadelphia, Pa.
Crosby Steam Gage & Valve Co., Bos-
ton, Mass.

Halk & Naumann, 516 Pearl, N. Y.

Picks and Mattocks.

Plumb, Fayette R., Philadelphia, Pa.

Pig Iron.

Houston, C. B. & Co., Philadelphia, Pa.
Montour Iron & Steel Co., Danville, Pa.
Naylor & Co., 45 Wall, N. Y.

Pilling & Crane, Philadelphia, Pa.
Samuel, Frank, Philadelphia, Pa.

Pig Iron Storage.

Am. Pig Iron Storage Warrant Co., 44
Wall, N. Y.

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Vulcan Iron Wks., Chicago, Ill.

Pipe Bent.

National Pipe Bending Co., New Haven

Pipe Cutting and Threading Ma-

chines.

Bignal & Keeler Mfg. Co., St. Louis, Mo.

Herrick Mfg. Co., Toledo, O.

Panocost Henry B. & Co., Philadelphia.

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Pipe Grips.

Frentiss Vice Co., 44 Barclay, N. Y.

Pipes, Flitting, &c., Makers of.

McNab & Harlin Mfg. Co., N. Y.

Pipe, Water and Gas, Makers of.

Cumberland Nail & Iron Co., Phila., Pa.

Ronaldson Iron Co., Emaus, Pa.

Riverside Iron Works, Wheeling, W. Va.

Wood, R. D. & Co., Philadelphia, Pa.

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Buck Bros., Millbury, Mass.

Planes, Manufacturers of.

Stanley Rule & Level Co., N. Y.

Plate Bending Rolls.

Schneekloth, H. A., 630 W. 28th St., N. Y.

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Bridgeport, O.

Lukens Iron & Steel Co., Coatesville, Pa.

Mahoning Valley Iron Co., Youngs-

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Moorehead-McLean Co., Pittsburgh, Pa.

McIlvain & Sons, Reading, Pa.

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Pottsville Iron & Steel Co., Pottsville,

Pa.

Singer, Nimitz & Co., Pittsburgh, Pa.

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town, O.

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Plating, Nickel, Brass and

Silver.

Wilmet & Hobbs Mfg. Co., Bridgeport,

Conn.

Pokers and Lifters.

Troy Nickel Works, Troy, N. Y.

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Watson & Stillman, 204 E. 43d, N. Y.

Polishing Wheel.

Le Massena, C. E. & Co., Newark, N. J.

Pest Hole Diggers.

Winter, L. R. & Co., Philadelphia, Pa.

Poultry Nettings.

Barnum, E. T., Detroit, Mich.

Gilbert & Bennett Mfg. Co., 42 Cliff

St., N. Y.

N. J. Wire Cloth Co., Trenton, N. J.

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Tyler Wire Wks. Co., W. S., Cleveland,

O.

Wright & Colton Wire Cloth Co.,

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New York Powder Co., 62 Liberty St.,

N. Y.

Power Hack Saws.

Millers Falls Co., 93 Reade St., N. Y.

Power Hammers.

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Dierelt & Eisenhardt, Philadelphia.

Jenkins & Lingel, Bellefonte, Pa.

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Stark Mch. & Tool Co., Buffalo, N. Y.

Stiles & Parker Press Co., Brooklyn,

N. Y.

Waterbury Mch. Co., Waterbury, Conn.

Presses, Power, Makers of.

Bliss, E. W. Co., Brooklyn, N. Y.

Manville, E. J. Mch. Co., Waterbury, Ct.

Merriman A. H. Mch.

Stark Mch. & Tool Co., Buffalo, N. Y.

Waterbury Farrel Foundry and Ma-

chine Co., Waterbury, Conn.

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Punches and Shears, Hand and

Power.

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Cockburn Barrow & Mch. Co., Jersey

City, N. J.

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Henderer, A. L., Wilmington, Del.

Schneekloth, H. A., 630 W. 28th St., N. Y.

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N. Y.

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chine Co., Waterbury, Conn.

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Rat and Mouse Traps.

Burditt & Williams, Boston, Mass.

Esteby, W. S., 65 Fulton, N. Y.

Ripley Mfg. Co., Unionville, Conn.

Reels.

Hendryx, A. B. Co., New Haven, Conn.

Razors.

Electric Cutlery Co., 113 Chambers, N. Y.

J. R. Torrey Razor Co., Worcester,

Mass.

Refrigerator Door Fasteners.

Conroy, P. J. & Co., Philadelphia.

Rivets.

Blake & Johnson, Waterbury, Conn.

Boyle Rivet Co., Muncie, Ind.

Burdon Iron Co., Troy, N. Y.

Cobb & Drew, Plymouth, Mass.

Henderson, Jas. S., 165 Greenwich, N. Y.

Plymouth Mills, Plymouth, Mass.

Starnburgh, J. H. & Son, Reading, Pa.

Townsend, W. P. & Co., New Brighton

Fa.

Riveting Machines.

Adt, Jno. & Sons, New Haven, Conn.

Rock Drills.

Sand Drill Co., 23 Park Place, N. Y.

Rolling Mill Machinery.

Allenton Rolling Mill, Allentown, Pa.
Lookhart Iron & Steel Co., Pittsburgh, Pa.
Passaic Rolling Mill Co., Paterson, N.J.
Pottsville Iron & Steel Co., Pottsville, Pa.
Roberts, A. & P. & Co., Phila., Pa.
The Phoenix Iron Co., Phila., Pa.
Tudor Iron Works, St. Louis, Mo.

Shears and Scissors.

Acme Shear Co., Bridgeport, Conn.
Heinrichs, R. Sons Co., Newark, N.J.

Sheet Iron and Steel, Manufacturers of.

Etna-Standard Iron and Steel Co., Bridgeport, C.
Cambridge Iron & Steel Co., Cambridge, Ohio.

Chess Bros., Pittsburgh, Pa.

Mahoning Valley Iron Co., Livingston, Ohio.

Moorehead-McCleane Co., Pittsburgh, Pa.

Pierson & Co., 29 Broadway, N.Y.

Singer, Nimick & Co., Ltd., Pittsburgh, Pa.

The Mahoning Valley Iron Co., Youngstown, O.

Alan Wood Co., Philadelphia, Pa.

Deweese Wood Co., McKeesport, Pa.

Sheet Metal Work.

Clark & Cowles, Plainville, Conn.

Sheet Zinc.

Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Shelf Brackets.

Koch, A. B. & Co., Peoria, Ill.

Sinks.

Douglas, W. & B., Middletown Conn.

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Sickels, Sweet & Lyon, 35 Barclay St., N.Y.

Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.

Skates, Roller.

Henry, M. C., Richmond, Ind.

Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.

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Reeves, Paul S., 760 S. Broad, Phila.

Soldering Coppers.

Clendenin Bros., Baltimore, Md.

Speaking Tubes.

Ostrander, W. R. & Co., 204 Fulton St., N.Y.

Wollensak, J. F., Chicago, Ill.

Specialties, Par. Articles.

Konigslow, O., Cleveland, O.

Speed Indicators.

Church & Sleight, 109 Fulton St., N.Y.

Speleter.

Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Spoons and Forks.

Boardman, L. & Son, New Haddam, Conn.

Holmes & Edwards Silver Co., Bridgeport, Conn.

Rogers, The Wm. Mfg. Co., Hartford, Conn.

Rogers & Hamilton Co., Waterbury, Conn.

Sporting Goods.

Hartley & Graham, 313-315 B'way, N.Y.

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American Spiral Spring Co., Pittsburgh, Pa.

Casy, Alanson, 240-242 W. 29th St., N.Y.

Dunbar Bros., Bristol, Conn.

Miller & Van Winkle, Brooklyn, N.Y.

Morgan Spring Co., Worcester, Mass.

Nourse, Fred, Co., 315 to 319 E. 22d St., N.Y.

Boland, Wm. & Harvey, Phila., Pa.

Sabin Machine Co., Montpelier, Vt.

Washburn & Moen Mfg. Co., Worcester, Mass.

Wolf, R. H. & Co., Ltd., 118th St. and

Harlem River, N.Y.

Spring Hinges.

Bardsley, J., 149 & 151 Baxter St., N.Y.

Chicago Spring Butt Co., Chicago, Ill.

Fullman Sash Balance Co., Rochester, N.Y.

Stover Mfg. Co., Freeport, Ill.

Van Wagoner & Williams Co., 14 Warren St., N.Y.

Stamped Ware.

Am. Stamping Co., 104 & 106 John St., New York.

Stamping Works.

Cleveland Stamping & Tool Co., Cleveland, O.

Staples.

Cobb & Drew, Plymouth, Mass.

Titchener, E. H. & Co., Binghamton, N.Y.

Steam Gauges.

Ashcroft Mfg. Co., 111 Liberty St., N.Y.

Bristol Mfg. Co., Waterbury, Conn.

Steam Hammers, &c., Makers of.

Dienert & Eisenhardt, Philadelphia, N.Y.

Dudgeon, Richard, 24 Columbia Street, N.Y.

Trethewey Mfg. Co., Pittsburgh, Pa.

Steam Heating.

Webster Warren & Co., Camden, N.J.

Steam Separators.

Goubert Mfg. Co., 32 Cortland St., N.Y.

Harrison Safety Boiler Wks., Phila., Pa.

Steel, Cold Rolled Strip.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Steel Figures and Alphabets.

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Wolf, C. H., 177 William St., N.Y.

Steel Importers.

Abbott, Wheelock & Co., N.Y. and

Boston, Francois, Seaman & Co., 97

John St., N.Y.

Jessop, Wm. & Sons, Sheffield, Eng-

land, or 91 John, N.Y.

Milne, A. & Co., 1 Broadway, N.Y.

Newton & Shipman, 88 John, N.Y.

Wetherell Bros., 98 Liberty St., N.Y.

Whitney, A. R. & Co., B'dway, N.Y.

Wolf, R. H. & Co., Ltd., 118th Street

and Harlem River, N.Y.

Steel (Musket's Special).

Jones, B. M. & Co., Boston.

Steel Manufacturers.

Etna-Standard Iron & Steel Co.,

Bridgeport, C.

Bethlehem Iron Co., S. Bethlehem, Pa.

Boker, Herman & Co., 103 Duane St.

Carbon Steel Co., Pittsburgh, Pa.

Chester Steel Castings Co., Phila., Pa.

Chrome Steel Works, Brooklyn, N.Y.

Crescent Steel Co., Pittsburgh, Pa.

Eiken & Co., Haren, Germany.

Frankford Steel Co., Philadelphia.

Gauthier Steel Department of Cambria

Iron Co., Johnstown, Pa.

Miller & Van Winkle, Brooklyn, N.Y.

Moorehead-McCleane Co., Pittsburgh, Pa.

Moorehead, 88 John, N.Y.

Naylor & Co., 45 Wall, N.Y.

Pottsville Iron and Steel Co., Pottsville, Pa.

Rowland, Wm. & Harvey, Frankford

Philadelphia.

Singer, Nimick & Co., Pittsburgh.

Stanley Works, New Britain, Conn.

Steel & Iron Improvement Co., Pitts-

burgh, Pa.

Taylor Iron & Steel Co., High Bridge, N.J.

Wordlaw, S. & Co., Sheffield, Eng-

Wetherell Bros., 98 Liberty, N.Y.

Wilmot & Hobbs Mfg. Co., Bridgeport

Conn.

Steel, Manufacturers' Agents.

Barnes, C. K. & Co., Philadelphia, Pa.

Corning, Edw. & Co., 29 B'way, N.Y.

Frassee Co., 19 Warren St., New York.

Lindsay, Jas. G. & Co., Phila., Pa.

Pierson & Co., 29 Broadway, N.Y.

Steel Rails, Manufacturers of.

Bethlehem Iron Co., S. Bethlehem, Pa.

Cambria Iron Co., Johnstown, Pa.

Montour Iron & Steel Co., Danville, Pa.

Riverside Iron Wks., Wheeling, W.Va

Steel, Tool.

Frankford Steel Co., Philadelphia, Pa.

Jessop, Wm. & Sons, Sheffield, Eng-

land, 91 John, N.Y.

Jones, B. M. & Co., Boston, Mass.

La Belle Steel Co., Pittsburgh, Pa.

Step Ladders.

Bicycle Step Ladder Co., Chicago, Ill.

Stocks and Dies.

Armstrong Mfg. Co., Bridgeport, Conn.

Billing & Spencer Co., Hartford, Conn.

Butterfield & Co., Derby Line, Vt.

Hart Mfg. Co., Cleveland, O.

Saunders' Sons, D., Yonkers, N.Y.

Wells Bros. & Co., Greenfield, Mass.

Wiley & Russell Mfg. Co., Greenfield

Stoves.

Frankford Steel Co., Philadelphia, Pa.

Jessop, Wm. & Sons, Sheffield, Eng-

land, 91 John, N.Y.

Jones, B. M. & Co., Boston, Mass.

La Belle Steel Co., Pittsburgh, Pa.

Stove Linings.

Ostrander Fire Brick Co., Troy, N.Y.

Stove Pipe Thimbles.

Cheney, S. & Son Manlius, N.Y.

Stove Trimmings.

Troy Nickel Works, Troy, N.Y.

Street Lamps.

Steam Gauge & Lantern Co., Syracuse, N.Y.

Strops.

Electric Cutlery Co., 118 Chambers, N.Y.

J. R. Torrey & Co., Worcester, Mass.

Structural Iron Work.

Berlin Iron Bridge Co., East Berlin, Conn.

Boston Bridge Wks., Boston, Mass.

Lindsay, Jas. G. & Co., Phila., Pa.

Wrought Iron Bridge Co., Canton, O.

Sulphuric Acid.

Matthiessen & Hegeler Zinc Co., La

Salle, Ill.

Tacks, Brads, Staples, &c.

Atlas Tack Corporation, Boston, Mass.

Clelandin Bros., Baltimore, Md.

Cobb & Drew, Plymouth, Mass.

Titchener, E. H. & Co., Binghamton, N.Y.

Steam Gauges.

Ashcroft Mfg. Co., 111 Liberty St., N.Y.

Bristol Mfg. Co., Waterbury, Conn.

Steam Hammers, &c., Makers of.

Dienert & Eisenhardt, Philadelphia, N.Y.

Dudgeon, Richard, 24 Columbia Street, N.Y.

Trethewey Mfg. Co., Pittsburgh, Pa.

Steam Heating.

Webster Warren & Co., Camden, N.J.

Steam Separators.

Goubert Mfg. Co., 32 Cortland St., N.Y.

Harrison Safety Boiler Wks., Phila., Pa.

Steel Importers.

Abbott, Wheelock & Co., N.Y. and

Boston, Francois, Seaman & Co., 97

John St., N.Y.

Jessop, Wm. & Sons, Sheffield, Eng-

land, 91 John, N.Y.

Milne, A. & Co., 1 Broadway, N.Y.

Newton & Shipman, 88 John, N.Y.

Wolff, R. H. & Co., Ltd., 118th Street

and Harlem River, N.Y.

Steel (Musket's Special).

Jones, B. M. & Co., Boston.

Steel Manufacturers.

Etna-Standard Iron & Steel Co.,

Bridgeport, C.

Bethlehem Iron Co., S. Bethlehem, Pa.

Boker, Herman & Co., 103 Duane St.

Carbon Steel Co., Pittsburgh, Pa.

Chester Steel Castings Co., Phila., Pa.

Chrome Steel Works, Brooklyn, N.Y.

Crescent Steel Co., Pittsburgh, Pa.

Eiken & Co., Haren, Germany.

Frankford Steel Co., Philadelphia.

Gauthier Steel Department of Cambria

Iron Co., Johnstown, Pa.

Miller & Van Winkle, Brooklyn, N.Y.

Montgomery, 45 Fulton, N.Y.

Wolff, R. H. & Co., Ltd., 118th Street

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Bickford Drill & Tool Co.	45	Clendenin Bros.	12	Fairmount Machine Co.	47	Ideal Mfg. Co.	71
Bicycle Step Ladder Co.	78	Cleveland Block Co.	79	Fearing, Wm. S.	2	Illinois Pure Aluminum Co.	74
Bigelow, C. R.	52	Cleveland City Forge & Iron Co.	1	Ferdinand, L. W. & Co.	71	Indiana Wire Fence Co.	4
Bignal & Keeeler Mfg. Co.	43	Cleveland Rubber Works.	68	Field, Alfred & Co.	66	Ives, H. B. & Co.	84
Billings & Spencer Co.	84	Cleveland Stamping & Tool Co.	73	Fitch, W. & E. T.	97	Jacobus, W. H.	90
Bingham, W. Co.	68	Cleveland Steel Co.	49	Fitchburg Machine Works.	41	Jarecki Mfg. Co.	40
Birmingham Iron Foundry.	23	Cleveland Stone Co.	48	Fitzsimons & Co.	17	Jeffrey Mfg. Co.	36
Bissell, E. Son & Co.	54	Clinton Twist Drill Co.	8	Flagg, Stanley G. & Co.	12	Jenkins Bros.	1
Blake & Johnson.	12	Clinton Wire Cloth Co.	3	Foos Mfg. Co.	98	Jenkins & Lingle.	49
Bliss Co., E. W.	38	Cobb & Drew.	12	Forehand Arms Co.	70	Jenner, H. W. T.	6
Boardman, L. & Son.	71	Coburn Trolley Track Mfg. Co.	76	Fraim, E. T.	2 & 77	Jessop, Wm. & Sons.	18
Bogert, John L.	49	Cockburn Barrow & Machine Co.	87	Frankford Steel Co.	19	Johns, H. W. Mfg. Co.	15
Boker, Hermann & Co.	18	Coes, Loring & Co.	85	Garrison, A., Foundry Co.	23	Johnson, I. G. & Co.	98
Boone, W. C. Mfg. Co.	25	Coes Wrench Co.	85	Garry Iron & Steel Rfg. Co.	6	Johnson, I. H., Jr., & Co.	45
Booth, The Lloyd Co.	28	Coffin & Leighton.	40	Frassé Co.	24	Johnson, S. C.	86
Borden & Lovell.	7	Colburn, A. M.	44	Frost Hill Spring Co.	73	Jones, B. M. & Co.	21
Borgner, Cyrus.	28	Colburn Electric Mfg. Co.	29	Fulton Iron & Engine Works.	45	Jones, Jesse & Co.	64
Boston Bridge Works.	15	Corbin, P. & F.	76	Gautier Steel Department.	15	Jones & Lamson Machine Co.	56
Boston Gear Works.	33	Corning, Edw. & Co.	16	Gardner, Jas. & Son.	25	Kayser, Ellison & Co.	18
Box, Alfred & Co.	45	Coldwell Lawn Mower Co.	88	Garrison, F. L. Co.	15	Keeley, Jerome & Co.	17
Boyce Rivet Co.	98	Colliau, Victor.	27	Gibbs Mfg. Co.	87	Kennedy, Julian.	26
Bradlee & Co.	16	Conroy, P. J. & Co.	78	Gilbert & Bennett Mfg. Co.	8	Keuffel & Esser Co.	61
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Bridgeport Gun Implement Co.	53	Cornwall Barrow & Machine Co.	87	Grand Crossing Tack Co.	11	Kilbourne & Jacob Mfg. Co.	86
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Britton, Horace E.	60	Crosby, G. A. & Co.	40	Gurney, F. B.	67	Knapp & Cowles Mfg. Co.	60
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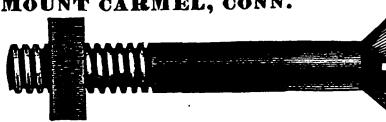
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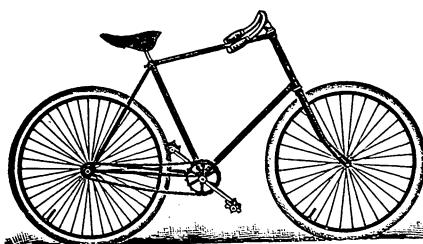
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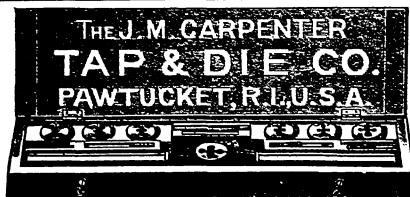
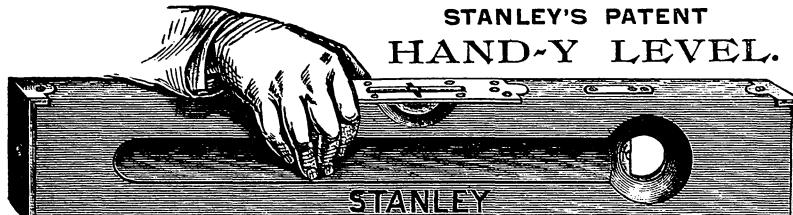
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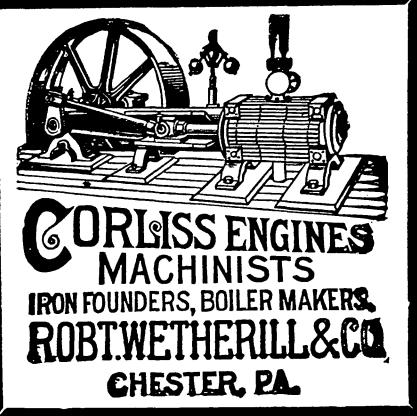
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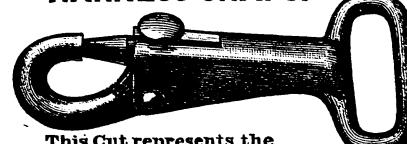
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THE IRON AGE

THURSDAY, NOVEMBER 9, 1893.

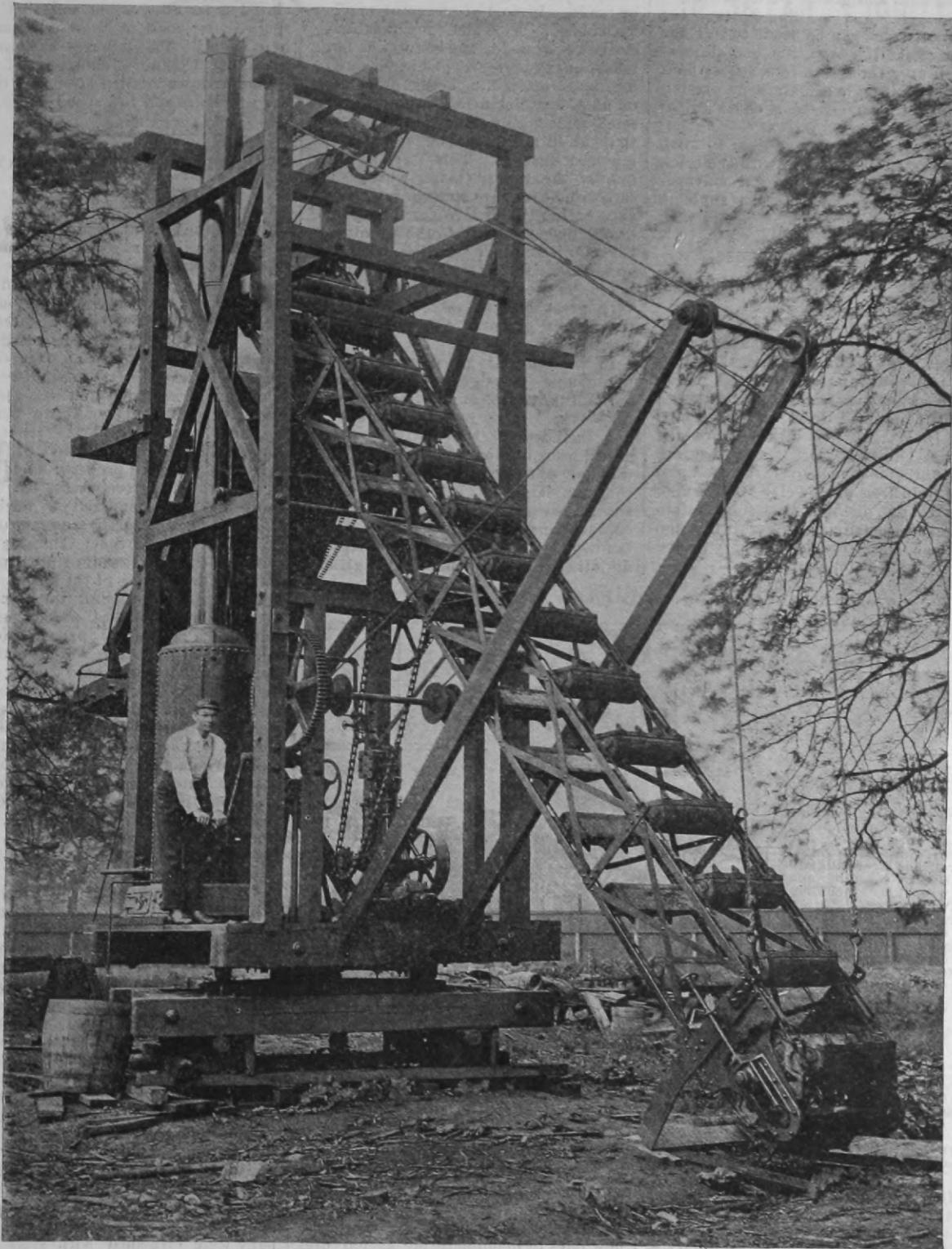
The Jeffrey Portable Elevator, Screen and Conveyor.

The engraving here presented shows a machine designed by the Jeffrey Mfg.

cars per day of 10 hours, making it possible to load 30 cars of sand to 10 cars of gravel, this depending largely upon the per cent, of sand in the bank.

The lower timber work is mounted on truck wheels to suit standard railroad

for the purpose of revolving the entire upper part of the machine on the lower frame work in a complete circular movement, thus enabling the operator to reach the bank from either side of track.



THE JEFFREY PORTABLE ELEVATOR, SCREEN AND CONVEYOR.

Company of Columbus, Ohio, which is designed for handling sand and gravel. It is arranged to dig the sand and gravel from the bank and then separate it and deposit it in separate cars. The capacity of this machine is about 40

gauge. On this track is placed a circular gear rack engaging with the gear pinion, which is fastened to an upright shaft on the upper frame work. Caster wheels and center plates are placed between the upper and lower frame work

The elevator is provided with the Jeffrey double strand steel chain, to which suitable buckets are attached. The buckets are made of heavy sheet steel, banded on the top edge with teeth riveted to the front lip for the purpose

of digging the material from the bank. This elevator is mounted on a wrought iron angle ladder frame, which is allowed to swing from the upper or delivery end of the elevator by means of two wire cables fastened to the lower end of the ladder and passing over the sheave wheels at the end of the jib timbers and down on to two spools on the frame work.

By means of crank and gearing the elevator is raised up to the bank, and then is allowed to work its way down to a line even with the track.

The sand and gravel are elevated and discharged on a shaking screen, the mesh of which can be made to suit the grade of sand desired, the gravel passing off over the screen to a rubber belt conveyor into the car, the sand passing through the screen to a chute below and into the car.

If it is desired at any time to work the elevator at an angle with the track the shaking screen, chute and conveyor are arranged to swing at an angle in order to keep them about square with the car.

Chicago's Iron and Steel Interests.

While the census figures for 1890 are for a period so long past that they have no practical business value, they possess historical interest. For this reason alone a statement concerning Chicago recently obtained from the Hon. Carroll D. Wright, now in charge of the Census Office, is worthy of attention. The statistics given cover the iron and steel industries of the city of Chicago, and do not include important establishments usually classed with Chicago but located outside of the city limits. The table is as follows:

Iron and Steel Industries for the City of Chicago, Illinois.

	No. of establish- ments.	Capital (b).	Average No. of em- ployees (c).	Total wages paid.	Cost of ma- terials used.	Value of products.
Iron and steel (a)	14	\$22,803,264	4,326	\$3,081,598	\$1,217,414	\$24,317,831
Minor iron and steel in- dustries:						
Foundry and machine shop products.....	213	22,410,275	13,130	7,797,613	13,874,810	30,227,816
Hardware.....	27	2,183,595	1,704	946,988	1,449,904	2,724,968
Iron and steel forgings.	6	688,000	259	194,712	364,523	687,400
Iron and steel nails and spikes, cut and wrought, including wire nails.....	4	723,104	376	193,008	289,830	635,084
Iron work, architec- tural and ornamental.	90	3,252,798	2,427	1,643,507	2,345,209	5,018,159
Springs, steel car and carriage.....	5	501,876	240	165,880	213,265	565,000
Steam fittings and heat- ing apparatus.....	16	2,626,628	2,224	1,269,260	1,552,824	3,921,738
Wire work, including wire rope and cable .	24	431,980	366	217,511	377,241	893,293
Total.....	390	\$55,621,115	25,052	\$15,500,877	\$39,284,420	\$68,991,295

(a) The weight of the products of these 14 establishments is 1,147,741 tons of pig iron and finished iron and steel.

(b) Does not include the value of hired property.

(c) Is a general average for all classes of wage earners, including officers and firm members engaged in the business or in supervision, also clerks.

It will be seen from this table that the foundries and machine shops of Chicago constitute the most important part of the city's iron and steel interests. The establishments engaged in architectural and ornamental iron work really belong to the same class. The aggregate thus formed comprised over 300 establishments, with a capital of over \$25,600,000, employing 15,500 hands. These foundries and shops are engaged in turning out practically the whole range of products covered by such works

anywhere. They have advanced from the mere jobbing establishments which spring up in growing towns, or the more pretentious works of the same class based on railroad patronage, until in creative and constructive capabilities they are found in line with the establishments in older sections whose fame rests on a reputation earned in past generations. While the production of the cruder forms of iron and steel is a very important part of Chicago's industrial prominence, yet it is in foundry and machine work that specially rapid progress seems destined to be made. Instead of becoming another Pittsburgh, in which manufacturing steel and iron for the country at large takes preponderance, Chicago seems destined to be a Manchester or a Philadelphia, manufacturing crude iron and steel into highly finished forms, and thus building up a congeries of the minor industries. This view is borne out by the rapidity with which such establishments have sprung into existence within the past two or three years, or else have removed to the vicinity of Chicago from other localities, both East and West. If a census could now be taken, it would undoubtedly disclose very great growth as compared with the figures given in the above statement.

In this connection it would be an unpardonable oversight not to refer to agricultural implement factories and car works. Such establishments were not included in the statistics above given, probably for the reason that they turn out a composite product. They consume large quantities of iron and steel, however, and their foundries, machine shops and forges employ thousands of skilled workmen. Perhaps in no other line has there been greater

promulgated, confirm the findings of the court. The report closes thus: "The 'Victoria' capsized owing to her water tight doors not being closed. Otherwise she would have remained afloat and reached port under her own steam. The general structure did not by any fault of principle contribute to her loss. Regulations will be issued to the fleet which, while maintaining the responsibility and discretionary powers of the commanders, will insure under certain circumstances, and especially when a collision is possible, that the water tight doors and hatches shall be closed as far as possible and that men shall be stationed at those necessarily kept open." The minutes express regret that Captain Johnstone of the "Camperdown" failed at once to order extreme helm and full speed astern.

The Columbia Iron & Steel Company.

Before the Circuit Court of Appeals at Pittsburgh last week an argument was made on the motion for the appointment of a receiver for the Columbia Iron & Steel Company of Pittsburgh, whose works are located at Uniontown, Pa. The attorneys who argued against the appointment of a receiver stated that the petitioning creditors are second mortgage bondholders and that the real estate is intact, and nothing has occurred to interfere with the securities. Any transactions complained of affect only the personal property and there is no need of a receiver as yet. The court has not rendered a decision. F. A. Yeager, formerly secretary of the Columbia Iron & Steel Company, has furnished the following statement regarding the troubles of the concern:

When in March, 1891, the company went into the hands of a receiver the Uniontown people and papers said the sole cause of the failure was mismanagement. Now they say hard times caused the second failure. At the first failure E. M. Butz started to work to have the receiver discharged, and got a lot of Uniontown men to advance money in return for enough stock to control the board. The stock was in trust and was to be returned when Mr. Butz got the company in a solvent condition. Mr. Butz got a five years' extension from the creditors and later got them to accept second mortgage bonds.

With the plant practically free from debt the Uniontown people took charge of it. Strikes closed Carnegie's beam mills and business boomed for the Columbia Company. The Uniontown people thought they had struck a gold mine. They elected Robert Hogsett as president. He had no experience in running a steel mill. The mill manager was forced to resign, and then Mr. Butz, vice-president, general manager and only practical man about the mill, was voted out. The president was voted a salary of \$10,000 per year and the secretary \$3600, where before the president got nothing and the secretary \$1500.

The company entered into a unique deal. The Reading Rolling Mill Company were furnished with steel beam blanks on credit, which they manufactured into finished material, and then out-sold the Columbia Company in the Eastern and Western markets. The Reading Company failed to meet their paper, and the Columbia directors got frightened and closed their works and began selling off the stock on hand. They then confessed judgment to themselves.

growth in Chicago in the past three years, either in the extension of the facilities of old works or the erection of new ones in manufacturing agricultural implements. In 1890 they employed an aggregate of 3945 hands, while last year one establishment alone employed as many, if not more.

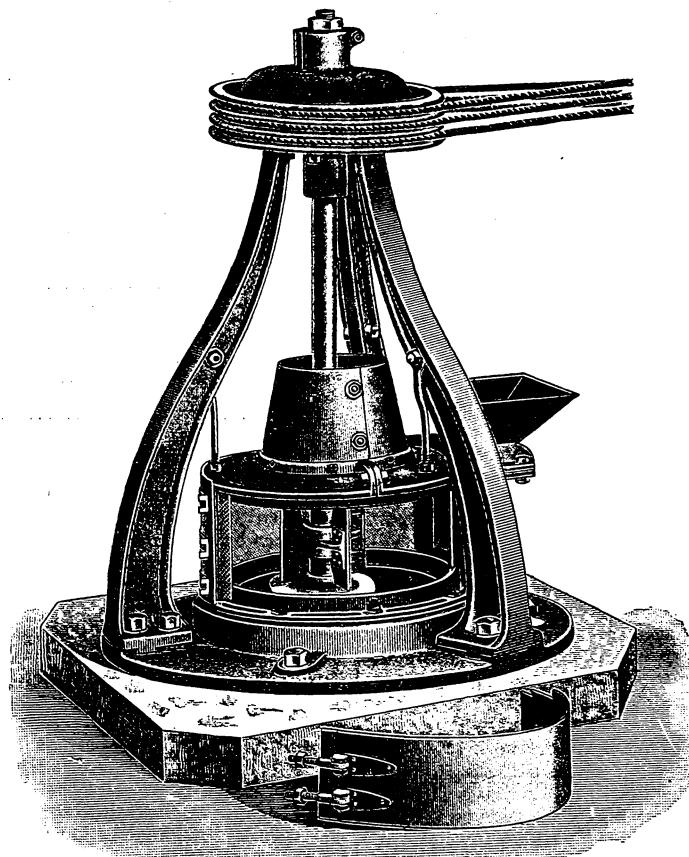
The minutes of the British Admiralty in the "Victoria" - "Camperdown" court martial, which have just been

The Griffin Mill Arranged for Rope Drive.

The Griffin mill, for the reduction of rock and ores of all kinds to a fine powder, employs in its construction the principle of a rigid roll on a suspended shaft running against a ring or die. The roll on the revolving shaft is free to swing outward against the die by the use of a universal joint, the centrifugal force holding the roll in contact with

The engraving represents a Griffin mill of small size, arranged for rope drive. This mill is intended for the same work as the larger ones, but is of less capacity. It will grind 12 to 15 tons of ore per day, with 10 to 12 horse-power. These mills are made by the Bradley Fertilizer Company of 92 State street, Boston.

After 18 years of active business at 85 to 91 Elm street, New York, the well-known firm of Ogden & Wallace,



THE GRIFFIN MILL ARRANGED FOR ROPE DRIVE.

the ring or die against which it runs. The shaft is suspended from a pulley above by means of a universal joint rotating with the pulley. The roll is revolved within the die in the same direction that the shaft is driven, but when coming in contact with the die it travels around the die in the opposite direction from that in which the roll is revolving with the shaft, thus giving the mill two direct actions on the material being ground.

The material to be ground is put into the automatic feeder, which delivers it into the pulverizing chamber, where the rapidly revolving roll with plows attached to the under side keeps the material in constant motion between the roll and die, and, as the whole mass of material is being stirred, the fine portion rises to the top and passes out through the screens.

On the shaft above the roll are fans, which draw in air through the conical housing and assist in forcing out the finished product. By this method no dust can escape except through the screens. After going through the screens the pulverized material passes through an opening into the receptacle underneath, from whence it can be conveyed wherever desired.

The mills will work either wet or dry.

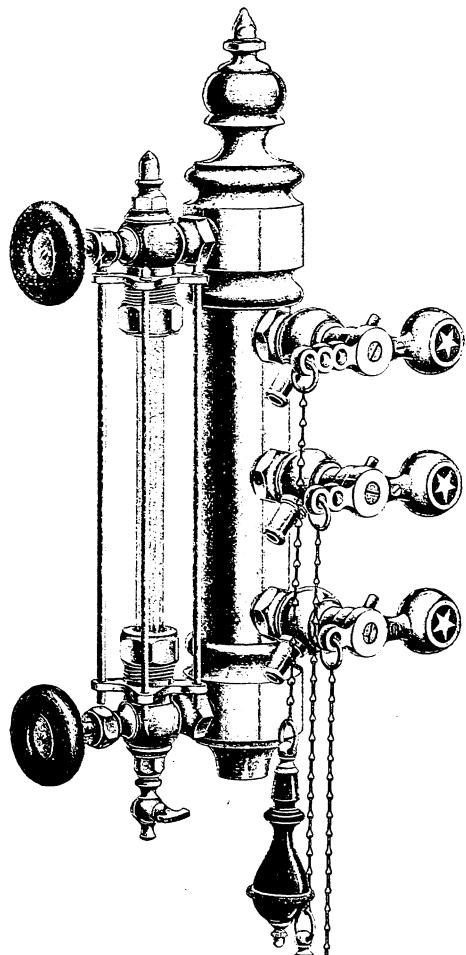
iron and steel merchants, are preparing to remove their business to more commodious quarters and a location more advantageously situated as regards transportation facilities and accessibility to tidewater. The firm are now having built for them a warehouse at the corner of Greenwich and Houston streets, the structure being after their own designs and being arranged with a view to the easy and expeditious handling of stock. The warehouse will be 100 x 100 feet in size, having doors on Houston and on Greenwich streets, with a driveway extending through from street to street. It will be one story in height, and the offices will be located in a structure built above, thus consolidating the entire business practically under one roof and providing for greater efficiency in carrying on the business. It is hardly necessary to state that the warehouse, as well as the office annex, will be equipped with modern conveniences for the economical and speedy conduct of business and delivery of stock.

The original firm was established early in the nineteenth century by George W. Shields at the corner of Broad and Beaver streets. The business is therefore one of the oldest in the iron and steel trades. Afterward the firm of Geo. W. Shields & Co. was established,

the Co. being Messrs. Smith and Hegeman, who afterward succeeded Mr. Shields. About 1868 the firm moved to the corner of Pearl and Dover streets, where the Brooklyn Bridge anchorage now is. Mr. Hegeman died soon after this, and the firm of Smith, Sturges & Co. was then formed, Messrs. Ogden and Wallace, who constitute the present firm, being the unnamed partners. In 1874 G. G. Smith retired, when the present partners succeeded to the business. A year later the warehouse and office of the firm were removed to the present location in Elm street, where, with greater facilities, the business has largely increased. It is expected with the larger and more modern warehouse now building and more advantageous location, that it will be still further increased.

The Star Gauge Cock.

The Star Brass Mfg. Company of 33 Lancaster street, Boston, Mass., are introducing an improved gauge cock especially adapted for high pressure boilers. It is provided with Jenkins' adjustable vulcanized packing, which is so arranged that by removing the ad-



The Star Gauge Cock.

justable screw it can easily be taken out and another substituted. The arrangement of the cock is clearly brought out in the engraving. These cocks are made with lengths of bodies from center of water gauge connections of 12, 15 and 18 inches.

One day last week New Orleans broke the cotton record with the largest receipts of the staple ever known at that or any other port, namely 54,433 bales.

Sheet Mill Progress.—I.

BY A. BEARD, CAMBRIDGE, OHIO.

Unlike other branches of the iron and steel industry, there has been no record of radical or noticeable changes in the method of rolling iron and steel sheets until recent years. In the manufacture of bars, structural shapes, plates, &c., the three high, universal or Belgian and reversible mills have almost entirely taken the place of old style two high rolls, but no one has to this date been intrepid enough to spend any very large amount of time or money in an attempt to revolutionize the old established process of making light sheets. Many improvements have been made in the manner of producing a high finish, and in a marked degree the quantity produced has been materially increased in mills devoted to the manufacture of sheets of ordinary finish, but so far as the initial process is concerned the sheet rolling industry occupies nearly the same position which it did 50 years ago. The inventions of Bessemer, Siemens and others have assisted progress in sheet mill practice and have provided means in the shape of steel billets and sheet bars for the production of sheets of first-class quality at about the same cost for which common sheets were formerly produced. Sheet mill managers have, however, combined their ideas with those of machinists and foundrymen, and as a result remarkable changes have been made in the construction of machinery.

English Practice.

Before referring to these changes in detail it is necessary to review briefly the causes leading to them. For this purpose a drawing is presented herewith to illustrate the method so long employed in English sheet mills. In English mills, Fig. 1, a stand of bar rolls is attached to each sheet mill on the outer end, and all pile rolling is done on these rolls. Muck bar piles, made sufficiently heavy to make two sheet bars of the required weight to produce sheets of a specified thickness, are charged into the pile furnace, averaging 15 to the heat. They are then passed through the bar rolls, and when drawn to the proper length are cut into two pieces at bar shears, which are operated by means of a small pair of pinions attached to the wabblers on outer end of bar rolls. On the lower pinion a lug is cast, upon which the long arm of the shear works. When cut to length, with the usual allowance for trimming after the sheets are finished, these bars are given two passes through the sand rolls, after which they are taken to the chilled rolls and are reduced to about No. 18. To accomplish this two sheets are rolled together. This completes the first part of the process, all being done without reheating. At this stage sheets are termed "singles." To still further reduce the thickness three sheets are placed together, and, after being reheated, are passed through the chilled rolls for the second time. This product is called "doubles." When sheets No. 26 to 30 gauge are required, the pack of three sheets is opened, the sides meeting each other are reversed and doubled, afterward placed in the reheating furnace for the third time, and again passed through the chilled rolls. When this work is completed sheets of No. 26 or 27 gauge are called "lattens," and lighter than this "extra lattens."

Prices paid for labor are regulated on this basis. After the rolling is finished the packs are taken to jaw shears and the edges trimmed. When sheets are made of iron there is a cut of 1 inch or more taken from the edges, as the sides of the pack crack when rolled; but steel sheets preserve a more even edge, and the amount required for trimming does not exceed $\frac{1}{2}$ to $\frac{1}{4}$ inch on each side of the pack. When the trimming is completed the sheets are annealed in the reheating furnace, and when cold are ready for shipment. Box annealing, or "close annealing," as the process is termed in England, is not a common practice. Fully three fourths of the sheets produced are annealed in an open furnace where the flame is allowed to come into direct contact with the surface of the sheets, the result being scale raising, red edges, burnt corners and a generally uneven appearance.*

American Practice.

In American practice all light sheets are box annealed, being placed on cast iron carriers upon which the sheets are piled, then covered with a cast or wrought iron lid, made air tight by piling sand around the bottom. This carrier and box are then drawn into the annealing furnace and heat applied. By using this method scale is not raised on the sheets—they are smooth, flat and of even color. It appears strange, from an American point of view, that the young English ironmasters do not avail themselves of this method, as it gives so much superior appearance to the sheets, but they are content to do as their predecessors did before them, a commendable trait except when competition is brisk and modern advantages necessary to success. In the matter of utilization of waste heat and the employment of power the English are very careful. Fuel is expensive. It will be noticed that a vertical boiler is attached to the sheet mill, Fig. 1. This boiler has one large central flue and two cross flues near the top. It is auxiliary to the steam plant of the establishment. The power of the engine is always used to its greatest capacity. To illustrate this, note that the jaw shear is operated by a long connecting rod attached to an eccentric on the main shaft.

It is a noteworthy fact that while imports of English sheets of iron and steel have decreased with the erection of American mills, English manufacturers make frequent purchases of American highly finished sheets for use as locomotive jackets, for lagging purposes, gas stoves and other uses where a fine appearance is required.

Labor in English and American Mills.

Comparisons of wages earned by English and American workmen have been made so often and prostituted to such base political purposes that the writer has not the assurance to present figures on this matter, but this article would not be complete without a comparison of the amount of labor performed in English and American sheet mills respectively. In English mills the crews work 12 hours each and do all the work they can in that time, taking only short intervals for meals. They commence with muck bar piles and do their own annealing. During 24 hours about 16,000 pounds of finished sheets are

* Box annealing is a common method in English and Welsh tin mills. This article refers only to mills making light sheets for galvanizing, roofing and general manufacturing purposes.

produced by two crews consisting of the following men:

Rollers	2
Roughers	2
Catchers	2
Furnacemen	2
Helpers	2
Prilers	2
Shearman (using jaw shears)	2
Markers	2
Scrap Boys	2
Total	18

Compared with this, American crews only work eight hours. They commence with sheet bars already prepared for them on an independent bar mill and have no annealing to do. There are three shifts during 24 hours, which produce about 19,000 pounds of finished sheets sheared ready for the annealer. To accomplish this work the following men are employed:

Rollers	2
Roughers	3
Catchers	3
Heaters	3
Pair heaters	3
Matchers	3
Doublers	3
Shearman (using squaring shears)	1
Hold up	1
Opener	1
Scrap boy	1
Total	25

The shearman and his helpers are allowed to shear for three shifts. They work about eight hours. From this statement it will be seen that the Englishmen have much the hardest time of it for about two-thirds as much money for their work. An English mill only turns out 16,000 pounds of product to 19,000 pounds in an American mill, but it takes seven more men to do the work in America. Having discussed the method of making sheets and the result obtained in England, it is in order to notice the means used for the purpose and compare with those now employed to produce the increased product and at the same time reduce the risk of breakage and consequent stoppage to a minimum. English and American sheet mills were similar 20 years ago excepting that Americans never aspired to the luxury of a stand of bar rolls for each mill. This being the case the old "housing," "housen" or holster as it is variously called in different localities will serve to illustrate old time machinery of both countries.

The piece of machinery represented in Fig. 2 is not as antiquated as a sheet mill man might imagine upon just looking at it. It is only 20 years old, being designed in 1873 for a sheet mill now in operation. It was reinforced at its weak points in 1885 and since that time has been reordered no less than seven times to replace broken ones. All orders being from the same mill. This housing weighs about 11,000 pounds. It is what is commonly known as flat-footed. In the evolution of sheet-mill machinery this old style housing and its dovetailed bed plate are dying hard. It is not until the executor or sheriff offers this kind of machinery for sale that the massive modern housing with its V-shaped bed plate and solid masonry takes its place. The pattern of the old style housing is still in possession of a prominent firm of iron founders at Pittsburgh. It was used as late as last year and is almost a counterpart of a piece of machinery manufactured by a well-known Staffordshire, England, concern for 50 years past. The rolls used in housings of this design are 20 inches in diameter, necks 15 inches in diameter and the wabbler 11 $\frac{1}{2}$ inches at

its largest part. To illustrate the difference in the strength of these rolls a sketch showing the relative sizes of the wabblers on the old style rolls and the modern 24-inch rolls is shown in Figs. 3a and 3b.

Chilled rolls, 20 inches diameter, for light sheet mills have long been considered all that was required in the way of strength in English mills, and some manufacturers in this country use rolls of that size to this day, but it is probably because they have their old housings and want to make the last penny out

sides of the furnaces. Under the coal bin shutes a narrow gauge track is laid, to convey sheet bars from the bar shears to the pair furnaces. The large and small engines are placed near together, so that only one man is needed to attend them. The small engine operates two pairs of shears, runs the machinery to raise annealing boxes and also runs the roll lathe. The annealing furnaces are near to the shears, and no material has to be handled twice. The process is progressive, from the billet furnace to the warehouse. All that has to be

the diameter of sheet rolls was changed from 22 to 24 inches and the mills were then equal to the work. As a result of increased output all rolling mill builders had to make patterns for heavier machinery. The housings have been increased in size, also the rolls. A mill recently built in the Mahoning Valley was constructed in such a heavy manner that the roll trains weighed fully one half more than a roll train constructed for a similar purpose 20 years ago—viz.: rolling light sheets from No. 18 to No. 30. The housings in this

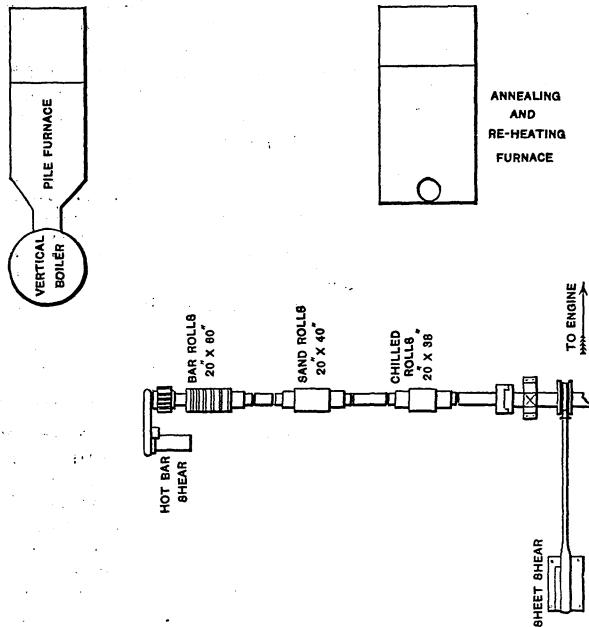


Fig. 1.—Plan of English Sheet Mill, 20-Inch Rolls.
—Weight of Housings, 11,000 Pounds.

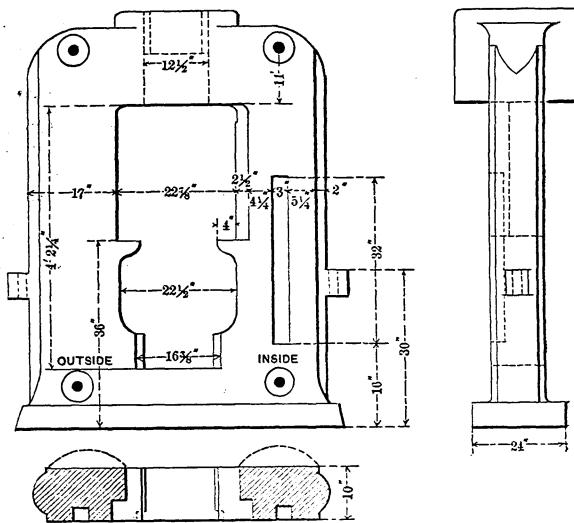


Fig. 2.—Old Style Housings, Designed 1873.—Weight, 11,000 Pounds.

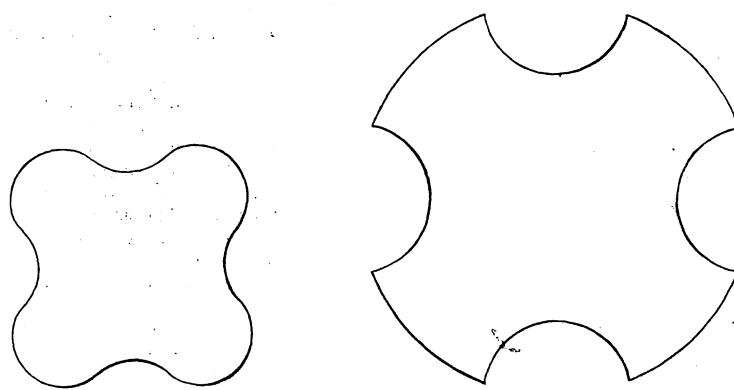


Fig. 3a.—Wabbler, English Standard 20-Inch Sheet Mill.

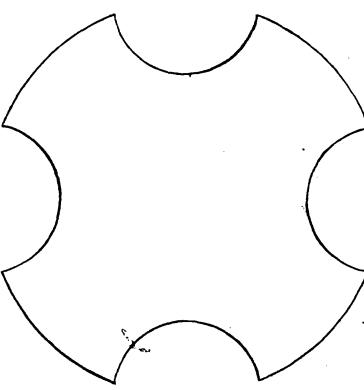


Fig. 3b.—Wabbler, American Standard 24-Inch Sheet Mill.

SHEET MILL PROGRESS.

of the old machinery and not because they do not acknowledge the benefits derived from using heavier machinery.

Heavier Machinery.

The main object of American sheet-mill men appears to have been to produce the largest quantity possible and so construct the machinery that breakages become exceptions instead of a rule. A great deal has been accomplished in this direction and the means employed are worthy of notice. The illustration, Fig. 4, of an American sheet mill plant shows many points of economy. Furnaces are all set near to the railroad coal track, so that coal is unloaded directly to the bins at the

brought back is scrap from the sheet shears to the scrap furnace. A plant of this description would turn out 35 to 40 tons per day of sheets, from No. 18 to 30 gauge, various widths, from 20 to 36 inches.

When the agreement made between rolling mill proprietors and the Amalgamated Association of Iron and Steel Workers, increasing 8 hours' work from 105 to 135 pairs of double sheet, came into force many mill managers found that their machinery would not stand the strain. Rollers "rushed their mills," breakages came fast, and managers grew furious. As a result the output was in many instances limited to the old standard, but in many mills

mill, illustrated herewith, Fig. 5, weighed 23,000 pounds and the bed plate 1000 pounds to the foot of roll train. The mill is running successfully and if a breakage occurs it will be a matter of much surprise. Of course, chilled rolls will break as they always have done, for no one has yet found a preventive. There is fame and fortune for the man who fathoms this unexplained mystery and devises means to keep chilled sheet rolls from breaking at an unexpected moment.

If translated reports are correct, Bohemia is ahead of the United States in the uses to which steel rolls are put. In American practice cast steel rolls have long been used in bar mills, and for rolling rails, channels, I-beams and other structural shapes, but the Bohemians are credited with having used steel rolls successfully in the manufacture of sheets. An order was placed with a Chicago concern some time ago for a pair of sheet rolls to be made of steel, but for some reason or other it was never filled. Can it be that herein lies a substitute for cast iron chilled rolls of every day use, that treacherous piece of machinery, the constant and unexplained breakage of which is the bane of sheet mill managers' lives? Is there no way of hardening the surface of a steel roll so as to make it impervious to scale marks, so that it will retain a smooth surface when in use, equal, if not superior to the surface of a chilled iron roll? It has been stated that steel rolls become pitted when used, that scale adheres to them, and that they are not suitable for obtaining a fine finish on a large area. If this purpose can be accomplished, and the

common theory regarding steel rolls be proved incorrect, then chilled roll makers will lose a profitable business which only years of successful practice makes profitable, and the steel sheet roll will furnish managers with a serviceable and unbreakable piece of rolling mill machinery, and it is quite probable that one-third of the sheet rolls now made will supply the demand. Strange things

dotted lines indicate the shape of rolls after they are dressed in a roll lathe ready for work, and while the roll is cold before work is commenced. The concave in these two rolls amounts to about $\frac{1}{64}$ and $\frac{1}{16}$ inch = 0.0284375. It varies according to the class of work to be performed. If wide sheets are to be rolled—*i. e.*, nearly the width of the body of the roll—the concave is

In ordinary sheet mill practice the rolls expand after the third or fourth heat until they are nearly straight. Good rollers exercise the utmost care in starting up their mills, and endeavor to avoid breakage through warming up too rapidly, particularly in cold or frosty weather, and they will continue at all times during their work to exercise care, avoiding extremes in the rise and fall of

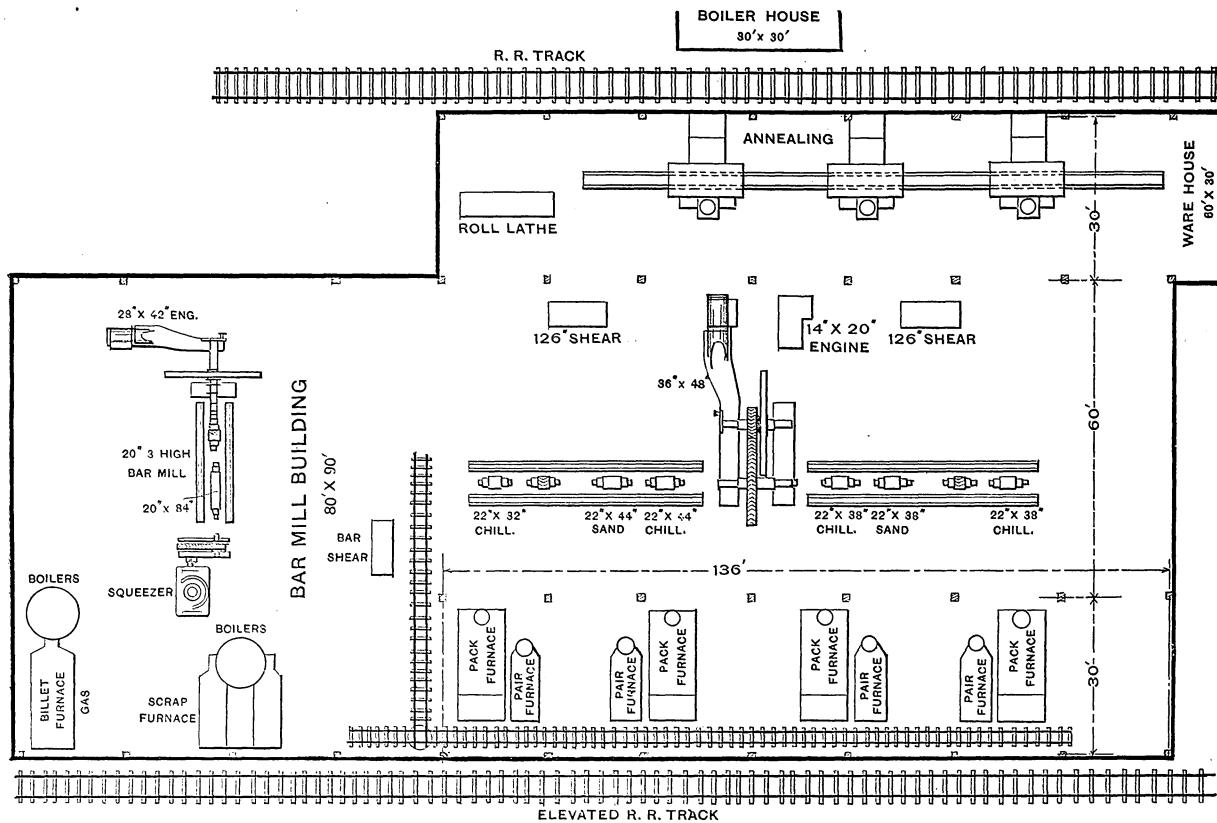


Fig. 4.—Plan of Modern American Sheet Mill.—Beard Design.—Capacity, 35 to 40 Tons per Day, No. 18 to 30 Gauge, 20 Inches to 36 Inches Width.

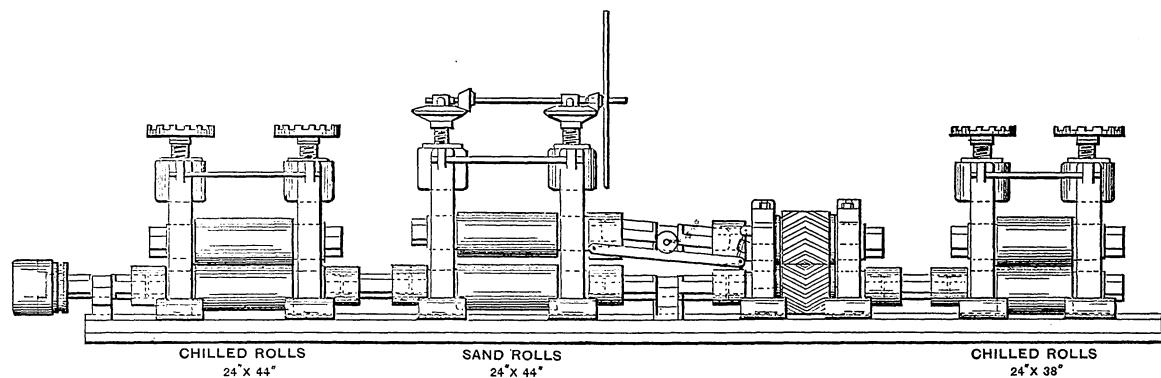


Fig. 4a.—Elevation of Modern American Light Sheet Mill, 24-Inch Rolls.—Weight of Housings, 23,000 Pounds.—Booth Design.

SHEET MILL PROGRESS.

have happened in the mechanical world. Why not this?

The Breaking of Rolls.

To explain more fully the trouble which sheet manufacturers who use the hot finish process have to contend with, and the exigencies which have to be allowed for in their cost accounts, a drawing is presented herewith to illustrate the degree of expansion and contraction to which sheet rolls are subjected during ordinary treatment.

The dark lines in the drawing show the shape of the rolls when heated, and

made in a lesser degree than if sheets of narrow widths are to be rolled, as narrow widths will "puff up" or expand the rolls near their center quicker than wide sheets, which distribute the heat more generally throughout the body of the rolls. In the manner of turning or dressing sheet rolls custom varies; some roll turners turn one roll straight and put all the concave in the other, while others divide it between the two rolls. This seems to be a matter of opinion the correct view of which has never, if properly demonstrated, been made public.

the temperature of their rolls and giving the screw pressure in accordance with conditions, but in spite of all this care the best of rollers meet with mishaps, a report like that of a carbine is heard, the pack buckles in the rolls and the roller realizes that he has "cracked one," to use a rolling mill expression.

Probably there is not a sheet roller living to-day who has ever told how he broke a roll, and if there is common cause for it the secret is well kept. Theory has, however, provided many causes, and reasons are given which

are worth consideration. Rapid expansion and excessive screw pressure are undoubtedly the two principal causes of sheet roll breaking. Upon those two causes all others rest except those attributable to machinery which is out of line, or culpable negligence, such as rolling bars not properly heated, &c. A modern sheet roll 24 inches diameter, of solid cast iron, is a massive looking affair to an outsider, and it seems incredible that they will break through their center without a moment's warning, nevertheless it is a fact. It is a trouble with which sheet mills the world over have to contend, and the proprietors are looking for a man who can find a remedy or a substitute. A cooling tube through the center has been tried without effect, and brasses having a current of water running through them were supposed to be a step toward greater safety, but rolls

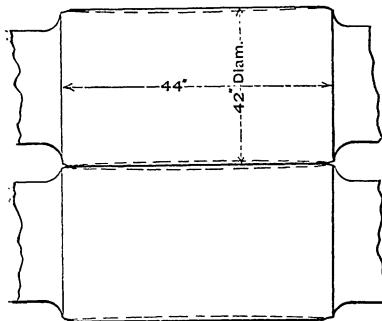


Fig. 5a.—Black Lines Show Shaping of Rolls when Hot and Expanded.—Dotted Lines Give Exaggerated View of Shape of Rolls when Cold and Contracted.

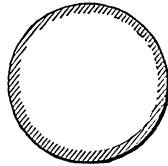


Fig. 5b.—Center of Roll, Open Grain.—Lines Show Chill, Varying from $\frac{1}{8}$ Inch to $\frac{1}{4}$ Inch.

SHEET MILL PROGRESS.

keep on breaking, and managers seem to have become somewhat reconciled to the no-cure theory and they devote their energy to preventing such misfortunes by training their men to exercise great care, keeping the rolls free from cold drafts of air, keeping the roll train in line, and such precautions. If a substitute is to be found it looks as though some outsider must furnish it. Can steel foundrymen do it? The writer does not say they cannot; the question is asked, not for curiosity, but for information.

The natural life of a sheet roll under ordinary wear and tear, average depth of chill, is about eight months. It is liable to be broken at any time during that period. A guaranteed life of that length would be well worth the price at which chilled rolls are now sold and a big premium attached.

By the recently issued report of the Minister of Mines of Tasmania, for 1892-93, it is shown that the quantities of the various minerals produced in that colony during the year were: Gold, 37,303 ounces; silver, 10,339 tons ore, and 23 tons bullion; tin, 5009 tons; and coal, 39,000 tons. The total value of the island's mineral output was \$3,257,385, exceeding that of the previous year by \$200,000.

WORLD'S FAIR NOTES.

The Standard Oil Exhibit.

Dr. David T. Day, in charge of the Standard Oil Company's great technical exhibit in the north gallery of the Mines Building, announced last week that the entire exhibit had been given to the Chicago University, to be held in trust for the Columbian Museum. The exhibit cost \$50,000 in collection and installation. It is the most complete and best arranged illustration of petroleum deposits, working and distribution ever made. All details are covered in this exhibit, and there is scarcely a question to be asked with regard to petroleum that has not been anticipated and a graphic illustration made to answer it. It is given to the Chicago University in trust so it may be held intact until the university trustees are satisfied that the museum is on a sound basis of organization and is prepared to install the display in accordance with the wishes of the donors.

The Columbian Museum.

The Columbian Museum, to which a slight allusion has been made above, is a contemplated outgrowth of the fair. Its projectors have secured a charter of incorporation and hope to retain the Fine Arts Building in Jackson Park as the home of the museum and a memorial of the great exposition. This building is strictly fire proof, being constructed of brick and steel, the only perishable feature being an outer coating of stucco, which can be renewed from time to time as it needs repairs or else can be replaced by something more durable. Valuable collections of a greatly varied kind have already been secured for it. Many of the exhibits are of such a character that their owners would prefer to give them away, although costing large sums of money, if they knew that they would be cared for or would serve a useful purpose. For some time there was doubt about the project succeeding, as it was seen that it would be expensive, and the city authorities had no power to assume such a burden. But last week Marshall Field, the merchant prince, whose fame has grown with Chicago's growth, made a gift of \$1,000,000, on condition that the incorporators raise \$500,000 more in cash and secure the donation of \$2,000,000 in exposition stock. This stock has a prospective value now of 15 to 20 cents on the \$1, owing to the very favorable turn in the affairs of the Exposition within the last two months. So many holders of stock have already given it to the museum, and so many citizens of Chicago have subscribed cash in addition, that Mr. Field's contribution is almost as good as clinched. Now that the museum project is in such excellent working order, the work of soliciting gifts for collections of various kinds by technical schools and other institutions have been in great measure abandoned, on the ground that it is better for the general good to have one great collection in such a museum than a number of fragmentary ones.

Other Collections.

Some institutions are and have been hard at work securing exhibits which they have paid for handsomely. The technical schools are prominent among these. Here again is the lavish generosity of a Chicagoan made conspicuous. Philip D. Armour, the packer, some time since gave his personal check for

\$50,000 to the Armour Institute, to be expended among the fair exhibitors for scientific and technical or educational apparatus. The agents of the Institute have consequently been active in inspecting exhibits and taking what they considered desirable. They are said to have secured the best of the instruments of precision and other scientific apparatus in the Electricity Building, while in the Mines Building very fine mineral collections have been obtained which would otherwise have been brought together slowly and at very much greater cost. This has been a grand opportunity for the Armour Institute, which has been appreciated at its full value. But other technical schools have not been idle. Their agents have also been at work. Their alumni have further been keen to see something that would be appreciated by the *alma mater* and have given much assistance in securing apparatus of great value or specimens of exceeding interest.

A Woman's Memorial Building.

So much was accomplished by women in showing the special aptitude of the sex in connection with World's Fair matters that efforts are being made to continue the work thus begun. Potter Palmer of Chicago, whose wife was the brilliant president of the Board of Lady Managers, has donated \$200,000 toward the erection of a building in some suitable location in that city. This is another of the many permanent influences growing out of the great forces exerted in the building up of the fair, and is made possible through the munificent endowment of one of Chicago's public spirited citizens.

The Passing of the Fair.

Those who counted on being able to supplement in November the partial sight-seeing previously done have been grievously disappointed. Exhibitors are too eager to get away, and, of course, exposition officials are anxious to accommodate them. Tracks now disfigure the grounds, while the interior of the buildings has been a scene of confusion since November 1, which has only been intensified every succeeding day. Some buildings are already half deserted, the work of removal being more quickly accomplished than had been deemed possible. Very shortly the deserted buildings will be all that is left of the glories of the fair and then the work of destruction will begin on them.

Summing Up the Attendance.

The World's Fair period extended over 183 days, of which 179 were open days, the exceptions being the four Sundays, May 7, 14, 21 and July 23, when the gates were closed to the public and open only to those whose passes denoted they had business in the grounds. Of the 183 days 27 fell on Monday, for Monday opened and closed the fair, while each of the other days showed up 26 times on the World's Fair calendar. Thursday was the popular day, although Monday and Saturday pressed it hard. But Monday's popularity, as shown by the attendance, was not fairly won, for Chicago day, with its 716,881 paid admissions, came on Monday, and it brought Monday's average up.

The daily attendance reports show that 3,621,358 people paid to get into the fair on 27 Mondays, or an average of 134,124; the 26 Tuesdays were chosen by 3,395,308 people, or an average of 130,588; the 26 Wednesdays by 3,208,310, or an average of 123,396; the 26 Thursdays by 3,531,047, or an average

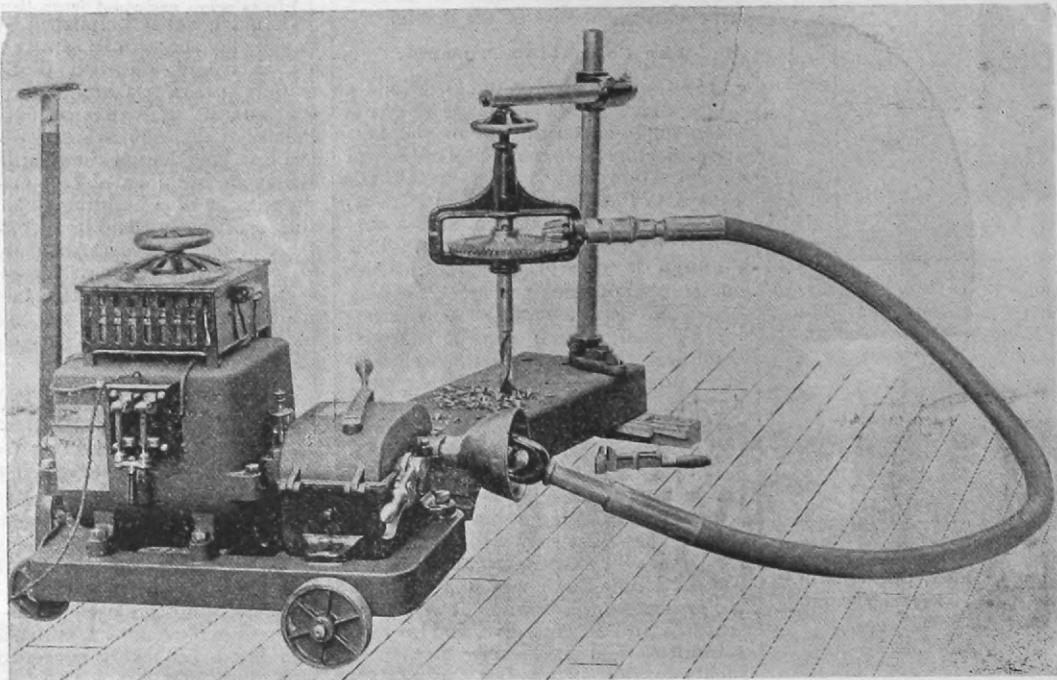
of 137,732; the 26 Fridays by 2,875, 379, or an average of 110,591; the 26 Saturdays by 3,576.975, or an average of 137,575, and the 22 open Sundays by 1,216,865, or an average of 55,312. The total Sunday attendance did not equal any of the last three weeks' attendance, and the average Sunday attendance was slightly more than one-half Friday's average, the poorest show day of the week. The smallest attendance came Friday, May 5, when 10,791 people paid to pass through the gates. The ten best days were as follows:

October 9—Chicago day..... 716,881
October 10—North Dakota day..... 309,294
October 11—Connecticut day..... 209,277
October 19—Ordinary day..... 305,961
October 21—Manhattan day..... 298,928
October 18—Ordinary day..... 292,458
July 4—Independence day..... 283,273
October 12—Italian day..... 275,217
October 17—Ordinary day..... 267,483
October 27—Coal, grain and lumber. 254,763

There were 92 days when the attendance rose above 100,000; 53 days

typifies the ascendancy of American genius on the Plaisance. From June 21 to October 26 the total number of passengers carried was 1,560,000. By a contract with the Exposition Company the Ferris wheel concessionnaires were not required to pay any percentage of their earnings to the exposition until they had taken in \$300,000, if the wheel should cost that much, or whatever the actual cost was, if less. The wheel cost about \$382,000. From June 21 to September 9 was required to reach the \$300,000 mark, and since that date 50 per cent. of the gate receipts have gone into the coffers of the Exposition Company. The greatest number of passengers carried on any one day was 38,750, the number of tickets sold on October 10. Chicago Day is next in line with 35,000 passengers. The number of people who rode on the wheel July 4 was 14,000. The average daily number of tickets sold during July and August was about 9000. About the middle of

ries on its side a double pole switch, and on top a starting rheostat. The motor is shunt wound and has two poles, with one spool on the top of the field. The armature is of the Gramme ring type, and its shaft carries a pinion serving to drive the flexible shaft through change and reduction gears, inclosed in a gear box, and running in oil or grease. A universal joint coupling connects the change gear shaft to the flexible shaft, which carries on the drill press end a clutch coupling which may be used for starting and stopping the drill. A second reduction in speed is obtained by the bevel gears driving the drill spindle. The drill press is held by a stand and arm which may be clamped in any position. Increase or decrease of speed is readily obtained by a movement of the side handle; and by another movement the intermediate gears are thrown in or out of mesh when the upper lever slides the change gears into position.



ELECTRIC PORTABLE DRILL WITH FLEXIBLE SHAFT.

when it passed 150,000; 25 days when it went ahead of 200,000; 11 days when it passed 250,000; four days when it was over 300,000, and one day when it was above 700,000.

The attendance by months does not vary except by moving forward and upward in an accelerated degree. May's attendance was 1,050,037; June, 2,675,113; July, 2,760,263; August, 3,515,493; September, 4,659,871; October, 6,816,435. Total, 21,477,212, of whom 1,253,938 were children.

The total attendance, including passes, was 27,529,400. During the Fair 40,000 monthly and 39,840 full term photographic passes were issued. These, with the complimentary cards, workmen's tickets, trip passes and return checks, were used to the number of 6,052,188. Of this total 1,703,428 represents the return checks, giving a net total of passes of 4,348,760.

THE FERRIS WHEEL.

The Ferris wheel paid \$120,000 into the treasury of the exposition since September 9. The Ferris wheel is to the Columbian Exposition what the Eiffel tower was to the Paris exhibition. It

September the number of passengers increased, and since then the daily average has been considerably over 20,000. No announcement has as yet been made by the management of the removal of the wheel. By the contract the removal of the wheel is not required before May 1, 1894.

Electric Portable Drill with Flexible Shaft.

In that part of the General Electric Company's exhibit in the Electricity Building, World's Fair, devoted to motors and their different applications was shown a portable drill with a flexible shaft. This has been brought into existence to avoid the inconvenience experienced whenever it becomes necessary to drill a piece of metal too large and cumbersome for manipulation under an ordinary upright drill, and to do work usually done with a hand ratchet drill more rapidly.

The machine consists of a motor and a gear box mounted together on a truck, a flexible shaft, a drill press and drill rest. In addition, the motor car-

This motor is rated at 4 horsepower and runs at 1000 revolutions, reduced at the drill spindle, according to the three positions of the change gears, to 167, 83 and 12 revolutions. The machine is built for use with drills up to 2 inches in diameter.

The new ferrule brought out by Randolph Clowes of Waterbury, Conn., is the result of considerable experimenting on their part to make some improvement over the old style cast ferrule commonly used by plumbers in making connections. The patent was granted on March 28, 1893, and at once the ferrule was put on the market and has sold in considerable quantities since. By their new process they are enabled to furnish these ferrules to the plumber smooth and made exact to size, which is not the case with the ordinary cast ferrule, which has to be smoothed down by the plumber, and oftentimes the pipes have to be made larger or smaller, as the case may be, in order to fit the cast ferrule. Therefore these ferrules save the plumber time and labor. As these ferrules are made from seamless drawn brass tubing and then formed up,

there can be no blow holes or sand holes. Each ferrule is tested before leaving the works. Since the ferrules are made of seamless drawn brass tubing it is not necessary to have the metal of which they are made so heavy and thick as in the cast ferrule. For a very slight additional cost these ferrules can be furnished with end tinned ready for instant use.

The Boston Steel Plate Exhauster.

The exhausters made by the Boston (Mass.) Blower Company are intended for removing shavings and sawdust from wood working machinery; dust from tumbling barrels or emery wheels, and for use in connection with hot-blast apparatus for conveying and distributing heat to hot rooms or dryers. They are made either single or double, and have heavy steel plate cases and

themselves of this opportunity can apply on any school evening between 7 and 9 o'clock.

The World's Fair Awards.

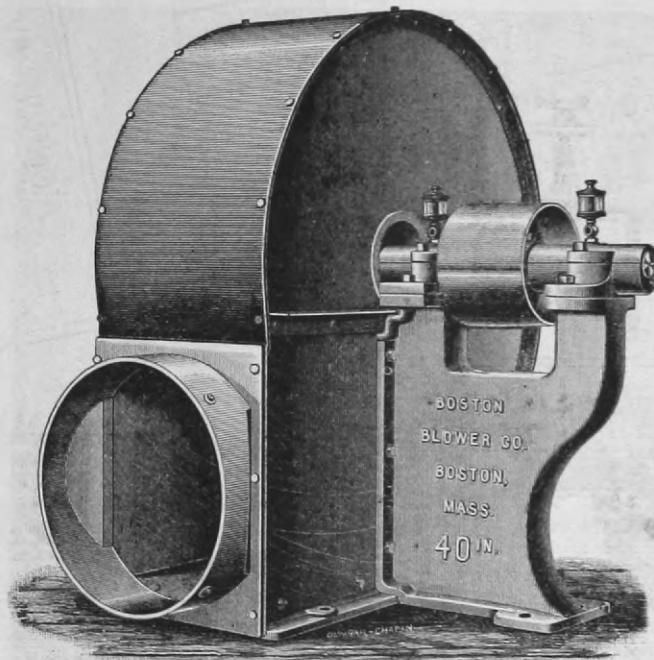
There seems to be a good deal of misapprehension concerning the World's Fair awards, which is encouraged for selfish purposes by some. A Chicago newspaper explains the system as follows:

"At most former international expositions the prize medal system has obtained. Advocates of the system followed here in Chicago say the prize medal system is faulty in that it disregards elements of excellence. Under that system an exhibit may receive a medal, yet be an inferior article. A maker of poor chocolate might receive the highest award because other chocolate makers had not made exhibits. In

medal may be indefinitely large. For instance, a watchmaker would receive only one medal for his exhibit, but he might receive a diploma for his gold watches, his silver watches, his ladies' watches, his gentlemen's watches, his hunting-cased watches and his open-faced watches.

"Under this system of awards the examination of the exhibits to determine those entitled to medals and diplomas was done by individual judges. This point also caused some friction early in the summer. The foreign exhibitors wanted to follow the European plan of having awards determined by jurors. Under the European plan, the jury on agriculture would determine all the awards for wheat, oats, tobacco, beer, condensed milk, coffee, Peruvian bark and linseed oil. At the World's Fair an expert judged each class of exhibits. A disinterested expert on wheat judged wheat, and so on through the list."

As we understand it a number of exhibits were assigned from time to time to each juror of a certain section. He made his report, which was submitted to the whole jury, of that section, and was accepted or rejected by it. There have been no "highest awards," or "first prizes," in the sense that it is usually understood. The medals are all of equal value, but the diplomas, which are based on the report of the jury, are worded in a widely different manner. They may make mention of specially meritorious points on which other diplomas given to competing goods are silent. It is the matter contained in the diploma which ranks the award.



THE BOSTON STEEL PLATE EXHAUSTER.

jackets secured to angle irons. The angle iron to which the jacket is fastened is on the outside of the case, making it easy to remove if necessary, and at the same time giving a smooth and unobstructed surface on the inside of the machine. The fan wheels are made on heavy T-iron arms, which are cast into a solid cast iron hub, the floats and side plates being securely riveted to the same. These wheels are carefully balanced, as are also the pulleys. The shafts are of steel and the bearings, which are long, are provided with adjustable sight feed oilers.

The hanger, which is bolted to one side of case and extending to the floor, is a heavy iron casting of the box pattern cored out inside, thus securing a very rigid bearing and true alignment.

A free class in architectural and mechanical drawing, under the charge of two instructors, has been started at the Senior Evening School, 58 Fifty-second street, New York. Students of architecture, machinists, stone cutters, carpenters, and persons working at trades in general who would desire to avail

such a case the medal would be no guaranty of the high quality of the chocolate—merely an evidence that it was the best brand of chocolate shown; and it might be the only one shown. Under the system governing the award of medals and diplomas at the World's Fair, the several elements of excellence are all noted. For instance, a judge of furniture examines a chair. He considers that chair, not in comparison with other chairs on exhibition, but as a single chair apart from all other chairs. He notes its form, the quality of material used in its construction, the workmanship, and the character of the finish. If it be up to the standard, it receives a medal and a diploma. In the diploma the several points of excellence are set down minutely. That chair may not be the best chair in the world, but it must be a good chair, else it would not receive a medal. Its good points are all enumerated in the diploma. A medal or a diploma from the World's Columbian Exposition is, therefore, a guaranty that the exhibit which receives a medal has high merit. Only one medal goes to any exhibit, but the number of diplomas under that one

The Queen & Crescent Route has issued a new Eastern tariff, effective November 1, giving the rates of freight on cast iron pipe in carloads of 30,000-pounds minimum. The rates to some of the more important points are given below:

To	From	
Albany, N. Y.	Aniston, Bassmer, Birmingham, Pell City and Piedmont, Alabama,	6.00
Allentown, Pa.	6.25	6.00
Ansonia, Conn.	6.85	6.60
Baltimore, Md. (all rail) ..	4.25	4.00
Baltimore, (" rail & water) ..	3.85	3.60
Bethlehem, Pa.	6.25	6.00
Boston, Mass. (all rail) ..	6.85	6.60
Boston, Mass. (rail & water) ..	6.45	6.20
Catasauqua, Pa.	4.65	4.40
Jersey City, N. J. (all rail) ..	6.05	5.80
Lancaster, Pa.	5.25	5.00
Newark, N. J.	6.05	5.80
New Haven, Conn.	6.85	6.60
New York (all rail)	6.05	5.80
New York (rail and water) ..	5.65	5.40
Philadelphia, Pa. (all rail) ..	5.25	5.00
Philadelphia, Pa. (rail and water) ..	4.85	4.60
Portsmouth, N. H.	6.85	6.60
Pottsville, Pa.	5.25	5.00
Rochester, N. Y.	5.50	5.00
South Bethlehem, Pa.	6.78	6.28
Sparrow's Point, Md.	6.52	6.02
Springfield, Mass.	6.85	6.60
Steelton, Pa.	5.25	5.00
Syracuse, N. Y.	5.80	5.30
Troy, N. Y.	6.25	6.00
Watertown, N. Y.	7.20	6.70
Windsor Locks, Ct.	6.85	6.60

By official statistics it is found that there were last year 1,109,014 *bona fide* members of trade unions in England. The number of unions was 431, with an aggregate capital of \$8,617,500 on hand. The sum of \$970,665 was paid during the year as unemployed benefits.

Works of the Bucyrus Steam Shovel & Dredge Company.

This company was originally established at Bucyrus, Ohio, about ten years ago. From small beginnings it grew and increased, and the original ground on which it stood became so crowded that a new establishment became necessary for the carrying on and development of the business.

The work executed by this company is divided into specialties, as follows: Steam shovels, light dredging machinery, heavy dredging machinery, railroad and locomotive cranes and wrecking cars, placer mining machinery, Bucyrus amalgamator system. Under these headings are included a great variety of auxiliary appliances and machines connected with similar

house; general store house, power house. Referring to the map, it will be seen that the works are planned with a view of systematic extension so that the capacity can be more than doubled as future requirements demand, and the works when thus added to will be a complete and systematic whole. The defects which are so manifest in nearly all great establishments which are the result of growth will thus be obviated.

The buildings are heated by the hot blast ventilating system. A complete system of standard gauge tracks connects all the buildings with each other, and likewise a narrow gauge track for hand trucks, as indicated on the plan, and a trans'er table provides access to the construction tracks in the end of the main building.

The distinguishing features of the plant are that all the buildings, with

smith shop blower; one motor, 15 horse-power, cupola blower; one motor, 5 horse-power, casting shop; three motors, 4 to 12 horse-power, foundry crane; three motors, 5 to 15 horse-power, erecting shop crane; total, 15 motors and 166 horse-power. Two multipolar generators each of 150 horse-power (one of which is a reserve), driven by a Corliss engine, are employed.

The largest motors and generators are of the slow speed type so that connection can be made from the motor direct to the line shaft with one belt.

Referring to the illustration, it will be seen that the roof of the main building is 120 feet span, divided into one central span of 60 feet and two side spans of 30 feet. One of the side spans is used as a machine shop for the lightest tools, and the heavy tools are placed out along the edge of the central floor so as

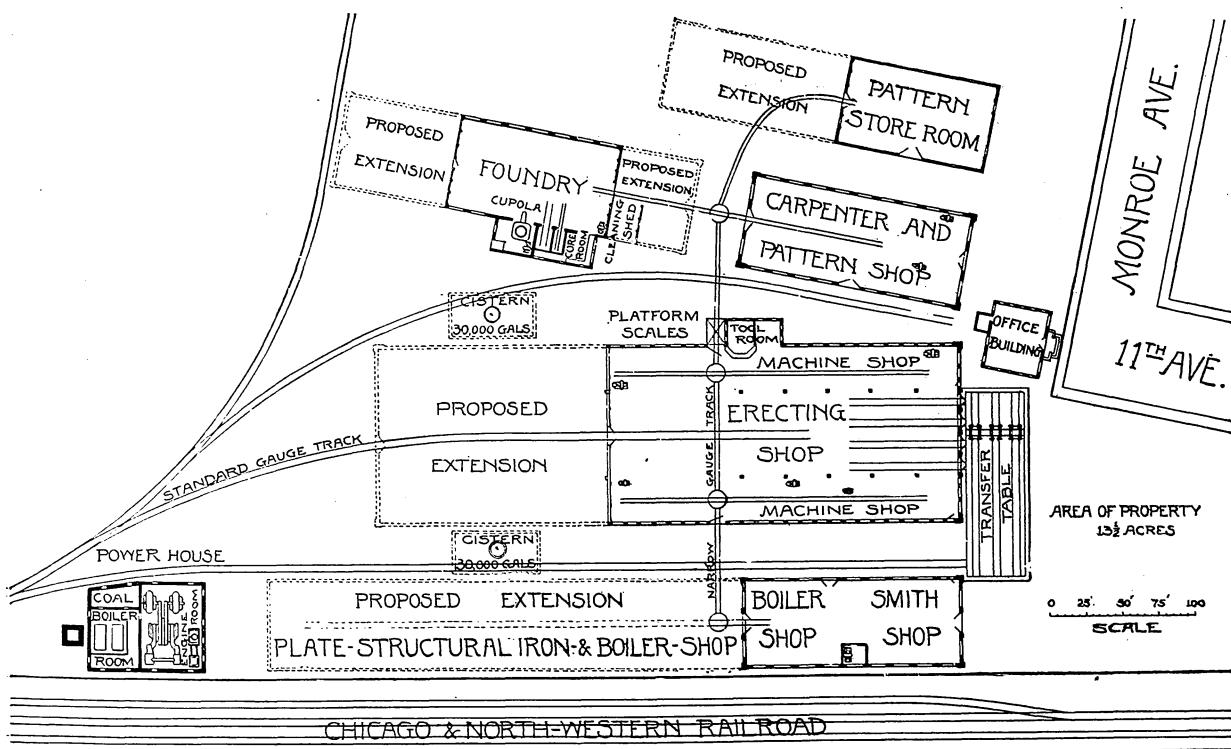


Fig. 1.

WORKS OF THE BUCYRUS STEAM SHOVEL & DREDGE COMPANY.

work, such as centrifugal pumps, ballast unloaders, pile driving machinery and machinery for public works.

The recently completed plant is located at South Milwaukee, Wis., on the line of the Chicago & Northwestern Railway 10 miles south of the city of Milwaukee. The ground occupied comprises 15 acres, divided into the main establishment, and shipyard located on the harbor on the lake shore, $\frac{1}{4}$ mile distant. Here a private and commodious harbor is secured with ample dock facilities, and connected with the main works by a belt line railroad.

The general plan of the buildings and a cross section of the machine and erecting shops are shown in the accompanying cuts, Figs. 1 and 2. The buildings are of steel, brick and glass, and comprise the following: Offices, 40 x 60 feet, three stories; main building, 120 x 240 feet, with overhead traveling electric crane the entire length; smith shop; plate and structural iron shop; foundry, with overhead traveling electric crane; pattern shop, carpenter and wood shop; pattern store

the exception of the offices, are ground floor only, and that electricity furnishes the sole means of distributing power throughout the entire works.

The reasons for adopting electric distribution of power are as follows:

1. It permits of complete isolation of the boiler and power plant from all of the buildings.

2. It permits the ready and convenient distribution of any desired amount of power to any desired place and at any desired speed.

3. It avoids the wear and tear and loss of power on machines that are used occasionally or intermittently.

4. The electric system lends itself to a variety of subsidiary uses, such as electric light, electric welding, electric traveling cranes, electric portable drills, &c.

The power is distributed from a central power house to the various localities where power is required, as follows:

Two motors, 15 horse-power, machine shop; two motors, 5 horse-power, boiler shop; two motors, 5 horse-power, pattern shop; one motor, 15 horse-power,

to be under the field of the overhead traveling crane. The smaller machine tools in which the work to be lifted is beyond hand power are served by compressed air hoists suspended from light jib cranes attached to the wall or to the pillars of the building.

Compressed air is used for the foundry hoist to the cupola platform, and an air cylinder having a tubular plunger is sunk in the ground and operates the elevator platform by direct lifting. Compressed air is used for blowing out cylinder castings and for testing small engines in the erecting shop.

The compressed air is furnished by a duplex air pump of the American air brake type, as used on locomotives. This is placed in the engine room, and a receiver kept charged at all times to the requisite pressure. There is no accumulator, and the apparatus is entirely automatic in its action.

The offices of the company are located in a separate building. On the ground floor are the business offices, with the general manager, superintendent and secretary. The whole of the

second floor is devoted to the drawing office, with the chief engineer's office, which has accommodation for 14 drafts men.

The work turned out by this company is of a very high order and of a varied description, necessitating a very complete system of records. The range of work runs from the lightest sectional steam shovel, capable of being transported on a mule's back, to the largest sea going dredge of 10,000 cubic yards capacity, and the dredges that have been already built number over 20 sizes, running up to the most powerful dredges in the world. The officers of the company are as follows: Wm. Hamilton Harris, president; H. P. Bolls, vice-president and treasurer; A. B. Stetson, superintendent; W. B. Crittenden, general manager; A. W. Robinson, chief engineer; J. M. Millman, secretary.

English Steel Production.

The production of Bessemer steel in Great Britain during the first six

months for the first six months of 1893, 1892 and 1891 is shown in the following table:

Districts.	1893.	1892.	1891.
	Tons.	Tons.	Tons.
South Wales	59,078	60,634	70,763
Northeast Coast	83,839	36,346	104,293
Sheffield, &c	11,262	12,995	29,891
West Cumberland	92,678	60,000	141,804
Lancashire and Cheshire	70,528	41,903	75,868
Totals	317,395	211,884	422,623

It is stated that the decline of 210,739 tons as between 1891 and 1892 appears to have been recovered during 1893 to the extent of 105,511 tons. The Northeast Coast and West Cumberland districts have recovered more largely than any of the others, but in the latter district one of the largest works, that of West Cumberland, is still entirely laid off.

The total number of converters in operation in Great Britain on the last

addition having been made to the railway facilities of the country under such adverse circumstances shows the urgency of the existing demand for additional steam transportation facilities. The only States which have not secured new tracks during the year are Vermont, Connecticut, Delaware, Maryland, Nevada and the Indian Territory.

Brown Segmental Wire Gun.

The Brown Segmental wire gun, during the Government test at Sandy Hook on Thursday last, gave the highest velocity ever known. The following is the official report of Capt. Frank Heath of the result obtained on that occasion: With 30 pounds of the Leonard smokeless powder and a 60½-pound shot, a muzzle velocity of 3130 feet per second was obtained, with a breech pressure of 53,800 pounds per square inch. This exceeds any record ever obtained with any gun of similar length, with equivalent weight of shot, and is ahead of the previous world's record obtained with

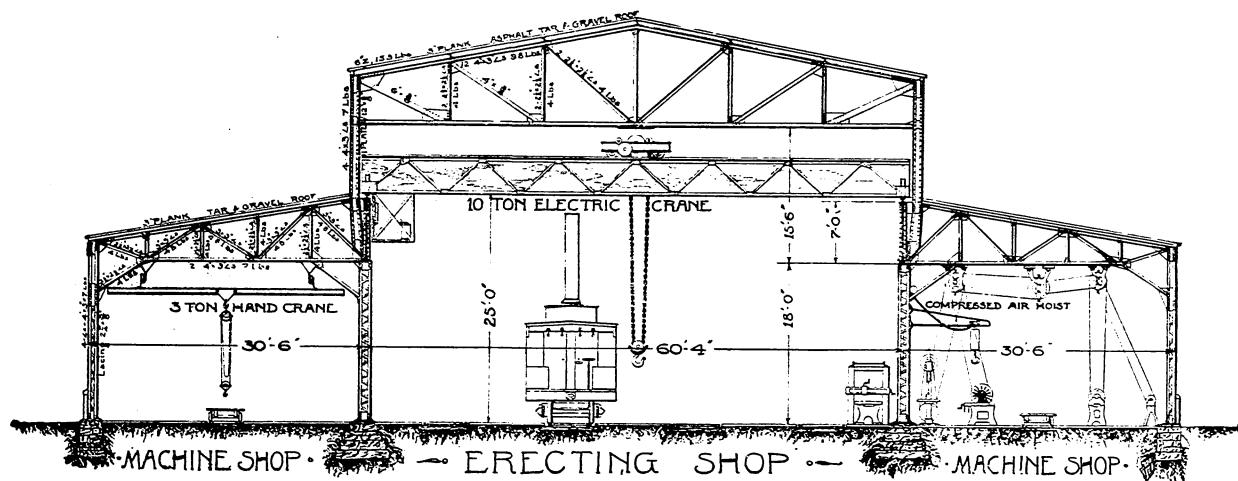


Fig. 2.

WORKS OF BUCYRUS STEAM SHOVEL & DREDGE COMPANY.

months of the current year is given in the report of the British Iron Trade Association, just issued. It shows that the total production of Bessemer steel ingots was 784,712 tons, of which 656,774 tons were acid and 127,938 tons were basic material. By districts the production was as follows:

Districts.	Acid.	Basic.
	Tons.	Tons.
South Wales	209,909	95,136
Northeast Coast	77,177	22,949
Sheffield	156,174	...
Lancashire and Cheshire	118,378	...
Staffordshire, Scotland, &c.	27,311	...
Totals	656,774	127,938
Total production, 1892	544,399	105,417

During the same period of 1892 the Cleveland district produced 39,878 tons of basic material, and Staffordshire and Scotland 47,659 tons, representing an increase in the first instance of 37,809 tons, and a falling off in the second case of 20,348 tons.

The production of Bessemer steel

of June, 1893, was 62, as compared with 65 in operation at the same time last year.

Railway Building in 1893.

In spite of the financial stringency and general business depression of the past few months, the work of railway construction has gone on uninterruptedly in 42 of the 48 States and Territories of the Union. The *Railway Age* calculates that 2040 miles of track were laid in the first nine months of this year on a total of 182 lines, over 1000 miles having been constructed since July 1, when the panic was at its height. There is in sight, besides, sufficient unfinished work to make the total length of new track for 1893 at least 3000 miles, but it is hardly likely, considering the number of enterprises that have been temporarily postponed by the monetary stringency, that the total for the year will much exceed 2500 miles. Yet under the extraordinarily unfavorable conditions that have prevailed of late months, this showing will be anything but a bad one. The only wonder is that construction did not altogether cease, and the fact of this substantial

the same gun and powder on August 18, 1893. Thursday's record gives a muzzle energy of 4216 foot tons, which is equal to 1016 foot tons for each ton of weight of gun, and to 140 foot tons for each pound of powder burned. The pressure of 53,500 pounds per square inch is the ordinary battering pressure of the Brown wire gun. It will be noticed that the powder charge used was one-half of the weight of the shot. So far as known the Brown gun is the only gun in existence which admits of the use of such a charge of smokeless powder, and the velocity far exceeds anything ever obtained proportional to the pressure, with any powder in the world for the same weight of shot and length of gun. With an armor piercing projectile the velocity obtained would have been sufficient to penetrate about 19 inches of wrought iron or 13 inches of steel armor.

The coinage of gold in the United States mint in Philadelphia during October was the heaviest in the history of that institution. Over half of the \$15,000,000 ordered by the Treasury to be coined by December 1 was turned out.

Modern Fixed Ammunition*

BY HAROLD THOMAS ASHTON.

Continuous improvements in the loading and firing arrangements of firearms of all calibers and in their ammunition have been made, the end in view throughout having been to obtain the maximum efficient speed of firing by rendering the operations of loading and discharge as simple as possible, and so allowing the principal attention to be directed to aiming the shot. This final simplicity in action, in which the ammunition plays the principal part, has only been arrived at by the most elaborate preparation of the implements and materials used, with the result that the manufacture of a modern small arm or quick firing cartridge is not often excelled, either in the care exercised in the selection of the material and the multiplicity of the operations performed upon it or in accuracy of workmanship.

A complete cartridge is made up of: 1, Case; 2, explosive charge; 3, means of ignition; 4, projectile.

While the bullet, charge and means of ignition are essential for the use of firearms, the case is a comparatively modern addition, and merely a means of uniting the other components in a convenient manner, although at the same time it is the most important element in the safety of and ease of handling the cartridge. The functions of the case before firing are to form a tightly sealed receptacle for the explosive charge and the means of ignition and a holder for the bullet. In the act of firing its duty is to form an elastic gas check, preventing all escape of explosive gases past it; and after firing to free itself readily from the firing chamber.

The qualifications of a good cartridge case are therefore: 1, That it should be as strong and rigid as may be required for transport; 2, that it should fit easily but accurately into the firing chamber; 3, that it should retain sufficient elasticity to return approximately to its original dimensions after the pressure of the explosive gases expanding it tightly in the chamber has been released; 4, that it should be as light as is consistent with the strength required in it to resist rough usage and exposure in all climates and under all conditions; 5, that—since in all but the larger sizes of cases, to which this condition does not therefore apply, it has been found rarely possible to use a case more than once—the first cost should be as small as possible.

Attempts to fulfill these conditions have caused the paper case, which was consumed in the explosion and used in rifles carrying a permanent gas check in their breech action, to be replaced successively by a stronger paper case with a metallic base; by the rolled case still used for the Martini-Henry rifle, in which the thin sheet brass forming the body is used in much the same manner as the paper that preceded it; and finally by the solid drawn brass case, which has been adopted universally without material variation.

The body of the case contains the explosive, and when charged is closed at the front by the projectile. The thin walls form the gas check, which is completed by the strong base, in which is formed a central chamber for the primer. Round the base is a projecting

rim or head, or an annular groove, serving as a means of extracting the empty case from the firing chamber. The groove is more convenient for the purpose of packing, but it does not give so certain a hold for the extractor as the projecting head, which has accordingly been adopted in the British service.

Some of the larger cartridge cases for use in quick firing guns have been made with the base attached to the solid drawn body by riveting or screwing, chiefly as a measure of economy in the appliances used in manufacture; and smaller cases have been similarly designed, various advantages being claimed for them; but cases of this description do not supplant to any noticeable extent the solid drawn case above described. Until recently only small arms were supplied with fixed ammunition, but its use now extends to a variety of quick firing guns, the largest of which are of about "6" caliber. Its usefulness as a means of increasing the speed of firing is, however, diminished, and finally disappears, as the weight of a cartridge increases and becomes inconveniently heavy for dealing with by manual labor; and on this account the heaviest complete fixed ammunition in the British service is that made for the 6-pound quick firing gun, the cartridges used for the 4.7 and 6 inch guns having only the charge and means of ignition contained in the case, which is carried and loaded separately from the projectile. In contrast with these, the smallest varieties of fixed ammunition are those made for revolver pistols and practice with the Morris aiming tube.

As the manufacture of all kinds of solid drawn cases is conducted on the same lines, it will be sufficient to follow in detail the construction of the cases used in the Lee-Metford rifle, which may be taken as a type of the small arm cartridge cases adopted for the armies of the civilized world, and are made in the greatest numbers, with the greatest accuracy, and present on the whole greater difficulties in manufacture than any other variety.

Preparation of Material.

The material found to be most suitable for these and all other solid drawn cases (other than some of the smallest, which are of copper, and might be made of almost any ductile metal)—combining the strength and ductility necessary to withstand the heavy stresses to which it is subject during manufacture and in use, while being comparatively cheap—is an alloy of copper and zinc in the proportion of copper, 65 per cent. to 70 per cent., and zinc, 35 per cent. to 30 per cent. Small quantities of lead and iron are found in the best cartridge metals, but their presence is not particularly desirable. The total amount of metals in the alloy, other than copper and zinc, should not exceed 1 per cent. Only the purest brands of copper and spelter can be used with success for this alloy, and in casting it into ingots every care has to be taken to obtain them absolutely sound and free from all impurities such as scale or other foreign matter, which, together with blow holes, are the greatest enemies to success in its subsequent manipulation.

The ingots are cast in iron molds, already hot from the effects of previous use, and prepared by a rub down of seal oil and resin, or some similar varnish, to give a good surface to the casting. With a view of obtaining sounder metal, small quantities of phosphorus

and aluminum have been introduced into the alloy, but experiments have failed to show that the results are beneficial or the reverse. Entirely new metal does not work as well as that cast from a mixture, of which scrap cuttings, made in various processes in the manufacture of the case, form a large portion. Also, curiously enough, better results have followed where charges have been made from copper and spelter of certain brands and a scrap cast from different brands, than from charges in which the same brands of copper and spelter, used as a new metal also, solely compose the scrap metal of the charges; although no difference sufficient to account for the result was to be found by chemical analysis. It is also advantageous to have ample heat at command, that the charges may be melted quickly and with the smallest possible loss of zinc.

The exact dimensions of the ingots are to some extent a matter of convenience, provided that the thickness is such as to insure sufficient work being put on the metal in rolling to thoroughly solidify it. The possible importance of this may be indicated by the fact that an alloy has actually been made entirely by incorporating by pressure the two constituent metals in a fine state of division. The width of the ingot is dependent on the design of the machines used in the operations immediately subsequent to the rolling, and the length is limited by the facility in handling when the ingot is elongated in the rolls. The ingots for the manufacture of the Lee-Metford cartridge case are cast about 0.75 inch thick, and 2.25 to 4.5 inches wide, and about 2 feet 6 inches long. After they have been trimmed they are rolled down into long narrow strips 0.14 inch thick. By the earlier or breaking down rolls they are reduced much more in thickness than by the later, and they are annealed at intervals.

Formation of Cups.

The metal slip thus produced is passed, after having been trimmed and examined, through machines which punch out from it circular blanks 0.875 inch diameter, and at once form them into cups in the same die, Figs. 1 and

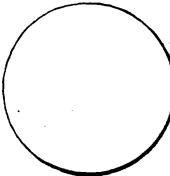
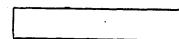


Fig. 1.—Blank.



Fig. 2.—Cup.

2. This die has a hole passing completely through it, made in two diameters; the first and larger of these, served with an annular punch, cuts the blank, which momentarily rests on the shoulder half way through the die, and is then, by a central punch working inside the annular cutting punch, thrust through the hole of smaller diameter and formed

* From the proceedings of the Institution of Civil Engineers.

into the cup. This operation, by straining the fibers of the metal over the dome and corners of the cup, serves to show any surface defects in the metal which have previously passed unnoticed, and at each subsequent stage in the manufacture of the case further torture of a similar nature reveals any defects existing in the metal as cast in ingots. The amount of metal at the end of the cup forming the embryo case cannot be augmented in the course of manufacture, and is even somewhat reduced. The quantity of the metal required in the head of the finished case therefore determines the minimum thickness of the strip from which the cup is formed, and consequently the amount of work which has to be done to extend and reduce the walls to the thickness required in the finished case, in the drawing operations to which the cups are subjected after they have been annealed.

Drawing Operations.

There are five drawing machines used in the manufacture of the case under consideration, and by them the principal work of manufacture is done, and from their nature the "solid drawn" case derives its name. These machines are all similar, and are only distinguished by each being fitted with the particular tools required for its share in the work. The cups, having been fed by hand into holes in a revolving table, are carried under a reciprocating punch, driven by an ordinary crank, connecting rod and slide, which, advancing in due course, forces them one at a time through the drawing die, which reduces their diameter and thins and extends their walls. Each case, adhering closely to the punch, upon which it is tightly compressed during its passage through the die, expands slightly when the passage is complete; while at the same time the die, relieved from strain, contracts; so that the sharp edges of the die catch on the edges of the case on the return of the punch, which is thus cleared in readiness for the next stroke. The punches and dies are copiously lubricated with soap and water to reduce friction and to prevent the work from being scored. In each drawing operation as much work is done upon the metal as is possible without permanently injuring it, hardening it considerably and causing it to require thorough annealing before the next operation. All the annealings, five in number, are conducted in the same manner. The cases are heated in covered pots or muffles to a dull red heat corresponding with about 650° C., and then allowed to cool slowly. Great accuracy in temperature is not necessary



Fig. 3.—First Draw.

to insure a satisfactory result, but care must be taken not to overheat the work, especially in the later stages, when the walls have been thinned. After annealing, the surface of the metal is cleaned by dipping it into dilute sulphuric acid. The drawing or extending operations do not succeed one another immediately in the development of the case, but are interrupted by the first indenting operation, in

which the cap chamber and head take rudimentary shape.

Indenting and Trimming.

There are two indenting operations in all, and the first is effected preferably after the first draw, and the second after the fifth draw. They are similar in manner, and, like the several draws, only differ in degree. After being indented the first time, the case appears as at Fig. 4, and after the second in-

flow of the metal and partly to the impossibility of keeping the punch and die absolutely in truth. As the mouth of the completed case must be of uniform substance and strength to prevent it from splitting when the cartridge of which it forms a part is finished, enough metal is provided in cutting the blank to make it, as it leaves the last drawing machine, considerably longer than is ultimately required. The surplus length is cut off in a machine

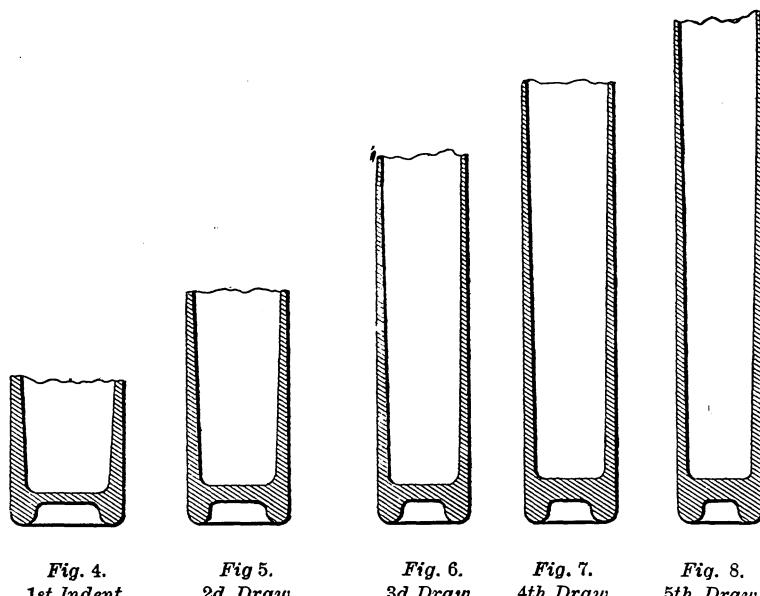


Fig. 4.
1st Indent.

Fig. 5.
2d Draw.

Fig. 6.
3d Draw.

Fig. 7.
4th Draw.

Fig. 8.
5th Draw.

denting as at Fig. 9. The results of the successive drawing operations are shown in Figs. 3, 5, 6, 7 and 8. For indenting, the case is supported internally by a bolster fitting it accurately and externally by a die. A suitably shaped punch is then driven into the base of the case, displacing the metal from before it and forcing it to flow backward along the annular space between the punch and the supporting die. For this

in which the cases are either fed by hand or by automatic feeding gear on a mandrel, or into a revolving spring chuck. A rapidly revolving circular cutter is then moved up against the case automatically, or by hand, and shears off the metal.

Heading.

Heading the case after it has thus arrived at its full length, Fig. 9, is a most

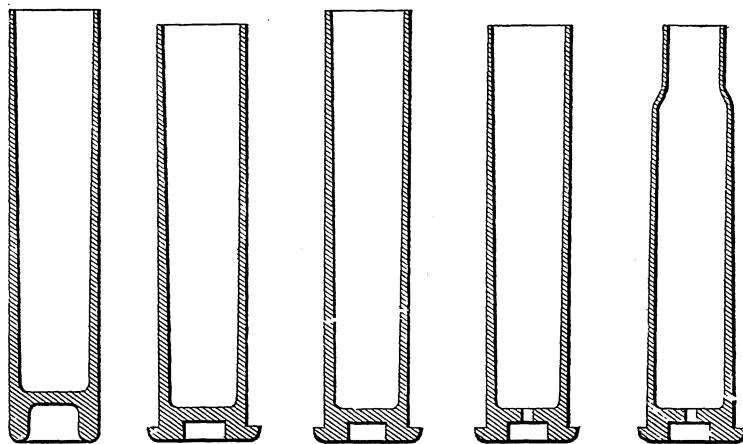


Fig. 9.
Trimmed and
Indented.

Fig. 10.
Headed.

Fig. 11.
Coned.

Fig. 12.
Pierced, &c.

Fig. 13.
Necked.

purpose the cases are fed by hand into the feeding slide of automatic machines, and are delivered by carriers in front of the operating tools, which act in the order given by means of cranks, cams, or a combination of the two, and are freed from the work by a stripper. When the cases leave the drawing machines their mouths are left with somewhat ragged edges. This is due partly to irregularity in the

important operation, for on it depends the perfect freedom from escape of gas about the cap or primer, as well as the ready extraction from the chamber of the rifle after firing—two of the most important points determining the efficiency of a cartridge case. Heading consists in upsetting the base of the case, in which there has already been formed a deep indent, so as to form the projecting rim on its circum-

ference and the cap chamber at its center, and at the same time to solidify the surrounding metal. The case after heading is shown in Fig. 10. The case is supported in the heading machine internally by a bolster and externally by a cylindrical die. The die does not, however, inclose the whole length of the case as in the indenting operation, but leaves a short portion projecting, sufficient to form the rim when upset. The heading tool, which is then impressed upon the case, consists of a dished die with a central projecting nipple of the exact size of the finished cap chamber. Just enough taper is given to the nipple to allow it to free itself after operating and leave the case on the bolster. Great care has to be exercised in making the indent in the base of the case before heading. If made too large the metal closes on the nipple in folds in the heading operation instead of homogeneously, and if made too small unnecessary work is thrown upon the nipple, which it is important to avoid, as only 0.001 inch latitude is allowed in the diameter of the finished cap chamber, so that the life of the tools is of necessity very short. The heading machines are of various kinds. In some of the earliest the cases are placed by hand on the bolsters, which, together with the supporting dies, are carried by a revolving table under a reciprocating heading tool driven by an ordinary crank, connecting rod and slide. Later machines have only one die and bolster, and in them the cases are fed by hand into the slide, from which they are taken mechanically and placed opposite the operating tools, which are brought to their work in the requisite order by cams or cranks.

Tapering.

The cases are next passed slowly over rows of gas burners, the flames from which play only on their mouths, thus softening them for a short distance up the body while leaving the base and body hard. This is done in order that the walls of the cases may easily adapt themselves to the tapering operation, which follows immediately, and to the necking or reduction in diameter of the mouth of the case, which takes place after the charge is inserted. The case is tapered or coned by two machines, in each of which it is forced into a die having a suitably shaped central cavity. In the first machine most of the reduction in the diameter of the case near the mouth is effected, and in the second the die gives to the body of the case the straight taper shown in Fig. 11, which is required to render insertion into and extraction from the firing chamber easy. After the head has been turned, the distinguishing marks stamped on its base, and the fire hole at the base of the cap chamber pierced, the case is cleaned. The cap chamber is then rectified, the mouth of the case rehammered, and it is passed on to be examined and loaded, after which the final operation of necking takes place.

Work is being pushed on the defenses of Boston harbor. The undertaking will include an armament of 12 12-inch guns, 15 10-inch and 5 8-inch guns, 128 12-inch mortars, and submarine mines to be operated from four mining casemates.

A steamer built recently in England, to run between London and Paris direct, has mast, funnels, boats' davits, flying bridge and other deck erections

all made to lower, in order to enable the vessel to pass under the low bridges of the river Seine.

English Pig Iron Production.

The British Iron Trade Association has published its usual report showing the production of pig iron in the United Kingdom in the first half of 1893. The amount produced during the first six months was 3,665,537 tons, against 2,790,918 tons for the corresponding period of 1892, or an increase of 874,619 tons. It is pointed out, however, that the decrease in production of the first six months of 1892 over the same period of 1891 was 921,000 tons, due in a large measure to the Durham strike of 1892, and that consequently the increase noted above is more apparent than real.

The production by districts is given in the following table:

District.	First half of the year.	
	1893.	1892.
Cleveland.....	1,361,285	600,819
Scotland.....	443,000	466,000
Cumberland.....	315,822	222,747
Lancashire.....	338,336	236,505
South Wales.....	368,341	322,687
Lincolnshire.....	105,692	109,817
Northamptonshire.....	88,833	88,998
Derbyshire.....	102,291	138,548
Notts and Leicestershire.....	132,321	187,624
North Staffordshire.....	106,900	98,573
South Staffordshire, &c.	152,215	170,135
South and West Yorkshire.....	102,967	124,789
Shropshire.....	20,180	25,335
North Wales.....	22,964	22,312
Other districts.....	6,540	17,499
Totals	3,665,537	2,790,918

Since the end of June 96 furnaces have been blown out in Great Britain, while only six have been started, leaving a net decrease in the number of furnaces in blast of 90, or representing a falling off in production of 1,530,000 tons annually.

The stocks on June 30, 1893, in producers' hands and in warrant stores amounted to 786,057 tons, or an increase of 85,607 tons over the first six months of 1892. The principal holders were Scotland, 336,383 tons, and Cleveland, 192,786 tons. It is stated that the present stocks of pig iron, taken as a whole, would not be equal to more than a month's capacity of the furnaces generally, and this fact is alluded to as one of the few satisfactory features of the present situation.

Brazil's domestic troubles are seriously crippling her foreign trade. Baltimore journals mention that shippers and importers at that point are feeling the interruption of commercial relations acutely. The coffee imports from Rio largely center at that port, which is also the seat of an important export trade in flour, provisions and manufactured goods to Brazil. This trade has been of late at a standstill.

Supervising Inspector-General Dumont, in his annual report as to steam vessels and steam boilers, recommends a change in the law which limits the thickness of the shells of externally fired boilers to 0.26 inch, so as to allow such boilers to be built of material of 0.31 inch thick.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., November 6, 1893.

The parliamentary attempt to secure the sanction of the House to a report of the projected Tariff Revision bill of the Committee on Ways and Means to the clerk of the House during the adjournment and the practical exclusion of the minority from participation in the measure, either by consideration in committee or in submitting a minority report, caused such a breeze that the scheme was compromised to the satisfaction of the minority end of the committee.

The work will now go on and when ready the minority members will be furnished with a copy of the bill and ten days will be given them for the preparation of a minority report. Chairman Wilson said immediately after the adjournment: "We will now work on long hours and make substantial progress on the bill and may expect to report it in about two weeks.

"There may be some radical departures from the details of former measures of a similar character, but this will be more in certain lines than in rates. The free raw material idea has long been advocated in sections where previously the tariff on protective lines was strongly advocated. We believe that certain raw materials free will be an actual benefit to manufacturers in general. Certainly free coal, now 75 cents a ton, would be popular in New England or California, or wool in the textile sections, or iron ore, now 75 cents a ton, in the iron manufacturing districts.

"The customs law of 1883 was a very carefully prepared measure, based upon most extensive hearings and investigations by an expert commission. The act of 1890 was based upon no such range of inquiry. Public sentiment on that measure was expressed several years ago. It has also most seriously crippled the Government by its prohibitory rates, which have made severe reductions in the revenues. A revenue tariff will afford ample protection and at the same time produce revenue. The losses in that direction by placing certain articles on the free list can be made up from other sources, although lower rates commensurate with the benefits of free raw materials may be fixed."

The metal schedule will be very thoroughly overhauled and the rates reduced, but to what extent has not been definitely settled.

It is proposed to make a cut on pig iron, round iron, beams and other structural shapes, plate, hoop, railway bars and rails, sheet, wire rods and wire.

Pig iron at $\frac{3}{4}$ cent a pound and railway bars and rails at $\frac{1}{2}$ cent a pound are the target of a lower rate, but the majority are not fully agreed to any reduction there, although it may be anticipated. The question of retention at the committee's rate will then have to be fought out in the House.

It will not be long before the new bill will be completed and printed, but it will be some time thereafter before it will receive concurrent action of the two Houses, and when it does reach that stage it will be somewhat modified and changed.

Arrangements are being made for holding a great Scandinavian Industrial Exposition at Malmö, Sweden, in 1896.

The Iron Age

New York, Thursday, November 9, 1893.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - HARDWARE EDITOR.
JOHN S. KING, - - BUSINESS MANAGER.

An Export Trade in Heavy Iron and Steel.

The low prices at which American iron and steel are selling in our markets have suggested to some not familiar with the situation outside of our country that we may become exporters on a scale of some magnitude. Some journalistic wiseacres are encouraging this impression, and in that way are doing harm. While we are convinced that this country will ultimately take its place as an important contributor to the world's markets, it is sure that the present range of values keeps us out of the race. Possibly when the next depression comes, and American manufacturers have learned to further reduce costs, then it may be wise to look about for means of developing an export trade in heavy iron and steel.

A few figures will suffice to put an end to all this talk of an export trade. Bessemer pig is selling at \$11.25 in Pittsburgh. Add \$2.80 for freight, and a tidewater price of \$14.05 is reached. The ocean freight, insurance, &c., would carry this up to \$15 at the very lowest as the cost delivered to an English port. This is at least \$3 per ton above the price there, and cuts off any possible chance in neutral markets.

Possibly American steel billets might be sold at \$20 per ton at tidewater, although the market is really closer to \$20.50. Now foreign billets are quoted, delivered New York, at \$28.50. The duty is \$8.96, so that foreign billets are selling, c.i.f. New York, lower than the American material. The only effect the lowering of the American price has had is to stop importations of common foreign billets for the export wire trade, under the drawback arrangement, because it has ceased to pay. In any case the Germans have done what business there has been, because they undersell the English makers. English quotations have no value, therefore, when comparing foreign and domestic billet prices.

Of course these are lines in which the only foreign markets are the home markets of our competitors. But in all rolling mill products which might go to common markets in other parts of the world we would be invariably beaten, except where reciprocity treaties give us the advantage. American bridge builders have in the past taken work in Central and South America, but that was because they built light pin connected structures, which foreign engineers have since

then learned to imitate. Lately bids for 550 tons of girder work for a Japanese railway have been submitted here, but aside from unfavorable financial arrangements, our bridge shops acknowledge that they cannot figure down low enough.

An occasional job in architectural iron work does come up for some public building, as was the case of a theater in a Venezuela town recently. But that comes to us because we are the pioneers in some classes of steel construction, and not because our material is low enough to allow us to compete on a tonnage basis.

A little export business is being done in bars made from scrap iron, but that is merely local and does not cut any figure. We have, however, done quite a respectable trade for many years in cut nails, since that has been an American specialty. We are doing a growing business in wire nails and barb wire, basing it all, until lately, upon foreign raw material. There is not much relief to our markets in that.

In the whole lines of crude materials and rolling mill products we have no right whatever to expect an export trade of any consequence, except possibly with some parts of Canada. There is an animus in the assertions to the contrary which one need not go far to see.

The Lesson of the Fair.

It is interesting and to some extent amusing to read what various writers have to say regarding the results of the Chicago Exposition. The magnitude of that enterprise in its every aspect has been an incentive to grandiloquent speech whenever the topic has come up for discussion. It has inspired lofty utterances from those gifted in that way, and a whole tribe of followers has sprung up who vie with each other in attributing to the fair almost revolutionary influences in the arts and sciences. A curious feature about this whole performance is that the most fervid prophecies regarding the influences of certain classes of exhibits are made by people who have no practical knowledge on the subject which they assume to discuss and about which they philosophize in airy abstractions. There is no doubt that in the matter of architecture American taste has been greatly cultivated by the beauty and originality displayed in the exposition buildings and many of the State and foreign buildings. The effect of this may be seen in the future, although it is questionable whether the severe plainness of the large structures now becoming such a conspicuous feature of our leading cities is not much better suited to this utilitarian era than the florid creations of ages long past.

In the matter of exhibits, however, conclusions are not so easily drawn. Never before was such a magnificent array of productions of every character brought together. While in some lines the very best was shown, this was not

the case in every line. Many famous manufacturers, whose reputation is world wide, were wholly unrepresented, while their competitors shone in their absence with inferior goods. How, then, in these lines, some of which have been singled out for special praise, could the progress of the art be specifically noted and a pace set for the world to follow hereafter?

It was a great show, and Chicago has won imperishable glory for the grand scale on which it was projected and the triumphant success with which the details were worked out. A great many people were given an opportunity to see more than they could have hoped to see if they were to live to the age of Methuselah with every facility for travel in their power. Perhaps invention has been stimulated and imaginative faculties have thus been quickened in a way that will be felt potently by this nation and the world in the years to come. But the fair nevertheless was a commercial enterprise, expected to be of practical benefit to the locality in which it was held, and all other considerations and influences, charming as they may be, are but secondary and subsidiary. In the light of the heroic struggle forced on the business men of Chicago to make their great enterprise a success, and in view of the narrow escape from serious dangers which might have financially wrecked them, the real lesson of the fair is that other projectors of World's Fairs must not base them on such a prodigious scale. There is but one Chicago.

Destruction of Capital.

An illustration recently presented itself to the writer of the rapid changes possible in the iron trade and the risks unconsciously taken by manufacturers. Four years since there was a mill making a staple article of consumption which was in such strong demand that the supply was by no means equal to the demand. The mill had been running for a year or more and was apparently in one of the best locations, as it was also one of the best equipped and most skillfully managed in the country. Within easy reach were three or four customers whose wants were at times in excess of the output of the mill, so that they were obliged to purchase part of their supplies from distant manufacturers. Other customers in the same line were in prospect, as new enterprises of considerable extent had been undertaken, presumably by men of means. So roseate was the outlook that plans were made for the erection of a duplicate mill and some of the contracts for machinery were placed when a change suddenly came over the scene. One good customer failed and his works were shut down, probably not to resume again. Then another and a larger customer failed, whose works may not be started until there is a decided revival in general business. A third customer dropped out of the race for business

to wait for better times. A fourth customer transferred his patronage to another establishment under a more favorable arrangement. The new enterprises were nipped in the bud by the frost which preceded the late cold wave of financial distress and therefore the prospective customers have not developed into actualities. The consequence is that the mill stands and has stood idle for a long time. It is well located, well equipped and ought to be making money for its owners, or at least affording them and their workmen employment. But for the time being it is dead and the capital invested in it is practically lost because it cannot be used when it is most needed. In this case the change was brought about so suddenly that it is hard to realize the cold facts in the case. There are perhaps numerous similar cases that can be cited. The good times all are looking for cannot come too soon.

OBITUARY.

DANIEL L. DAWSON.

A well-known figure in Philadelphia club and literary life passed away on Wednesday, November 1, in the person of Daniel L. Dawson, president of the Gray's Ferry Foundry & Boiler Company, of that city, who died suddenly of hemorrhage of the stomach, age 38 years. Mr. Dawson was born at Lewistown, Pa., and moved to Philadelphia with his father at an early age, the latter becoming engaged in the scrap iron business in the southern part of the city. Young Dawson was educated at La Salle College, and on graduating from that institution assisted his father in business. Later he became associated with his brother in the iron foundry business, under the firm name of John I. Dawson & Bro. After the death of his brother the name was changed to that of the Gray's Ferry Foundry & Boiler Company, Mr. Dawson filling the office of president. He was spoken of as an exceedingly clever business man, but latterly he devoted his time more specially to social and literary pursuits, leaving the management of the company largely to his assistant, Owen I. Roberts. Mr. Dawson was an unconventional man of much force and originality. An accomplished athlete, he was also a poet of no mean reputation, possessing a strange and fervent imagination, which was strongly reflected in his poetry. He was a member of the Manufacturers', Pen and Pencil and Art clubs of Philadelphia, as well as of the Athletic Association of the Schuylkill Navy.

JAMES W. SCOVILLE.

James W. Scoville, a prominent and wealthy citizen of Chicago, died at Pasadena, Cal., on the 2d inst. In his early career he was connected with the Chicago iron trade. He was born in Pompey, Onondaga County, N. Y., October 14, 1825. For a time he worked on the Erie Canal. In 1856 he went to Chicago. He secured the position of cashier for the Eagle Iron Works and subsequently became the assignee of that company. He helped to organize the Eagle Iron Works Company, of which he was treasurer and secretary for a number of years. In 1862 he severed his connection with that company and engaged in the real estate

business with J. D. Harvey. In 1869 in connection with T. M. Avery he organized the Prairie State Loan & Trust Company, now the Prairie State National Bank, of which he was president at the time of his death. He was also a director of the Elgin National Watch Company, president of the Chicago Screw Company and of the Cicero Water, Gas & Electric Light Company. As a man he was generous, exceptionally conscientious and scrupulously honest. Six years ago he gave Oak Park, which was then his home, the Scoville Institute, which cost \$75,000. He was a lifelong and consistent member of the Congregational Church and had given much money for missions and church improvements.

BENJAMIN S. BROWN.

Announcement is made of the sudden death, October 26, of Benjamin S. Brown, president of the Brown, Hinman & Huntington Company, Columbus, Ohio, and also of Withington & Cooley Mfg. Company, Jackson, Mich.

JULIEN P. CORDIER.

Julien P. Cordier, manager of the Lalance & Grosjean Mfg. Company's Chicago house, died November 2, at his residence, 5943 Wabash avenue, Chicago, in the fifty-first year of his age.

CORRESPONDENCE.

Boiler Awards.

To the Editor: Below we give copy of a special notice in relation to boilers at the World's Fair, Chicago, which we placed on the front of our boilers during the last few weeks of the fair. We would be very much obliged if you would give this notice a place in your reading columns, with such comments as you see fit to make:

SPECIAL NOTICE.

These boilers have received no Award. Why? Read! Learn!

We were informed that it was the purpose of the Jury to make awards on boilers based entirely upon the written statements of the exhibitors of boilers, without tests or any personal knowledge in the possession of said Jury concerning the comparative construction, operation, economy, or durability of said boilers.

We were asked to make such a statement, and were informed that all other exhibitors of boilers had been requested to make a like statement of their claims for the consideration of the Jury of Awards.

Believing that an award, based on such insufficient knowledge on the part of said Jury, could be of no practical value, and notwithstanding the expense incurred by this company in making an exhibit, we respectfully declined to make any such written statement for the purpose of receiving an award upon our boilers.

While we do not in the least envy those who have, upon such knowledge of the Jury, been awarded premiums, we are equally content to stand upon the record without an award based on such a knowledge of our goods.

Yours very truly,

THE BABCOCK & WILCOX COMPANY,
NAT. W. PRATT.

NEW YORK CITY, November 3, 1893.

The Effect of Cheap Beams.

To the Editor: Referring to Trenton "X.'s" comment on your late arti-

cle, "The Effect of Cheap Steel Beams," and suggestion "that it would be well to have added that a number of firms were in bankruptcy as a consequence of such cheapness," &c., let us say no tears need be shed while the full, round price per ton of \$34.75 is being gotten by the beam maker. This is relatively a "fat" figure to that gotten by the maker of staple lines of iron, wire, nuts, nails, pipe and other kindred productions these many months, and no lamentations were dropped on the public by "X." Where has he been all this time?

Until this nation uses the pounds of iron per capita that the less opulent ones of Europe do, the natural law of humanity will demand widening use. That beams are now offered at less than the ridiculously abnormal price they have been held at for years will contribute to our rapidly assuming a proper place in the iron consumption of the world. It is needless to say this widened use will stimulate demand for all other structural product of the mills. Your article was sound in tenor and exactly in the right direction. XX.

PERSONAL.

John Fritz has resigned his post of consulting engineer of the Bethlehem Iron Company, South Bethlehem, Pa., with which he has been connected for so many years.

F. A. Winchell, for a number of years prominently connected with the Crane Company of Chicago, as auditor, has associated himself with the New York Belting & Packing Company, Limited, 13 Park Row, New York City, as manager of sales department.

A. J. Forbes-Leith of the Illinois Steel Company arrived from Europe last week.

Professor Lunge of Zurich, Switzerland, the authority on chemical manufacture, has sailed for home.

John A. Potter, for some years superintendent of the Homestead Steel Works, Homestead, Pa., but for the past year or so chief mechanical engineer of the Carnegie Steel Company, Limited, Pittsburgh, has resigned his position with that firm, taking effect November 1, and has assumed the position of vice-president and superintendent of the Britton Iron & Steel Company, Cleveland, Ohio.

A dinner to the officers of the Chicago Shipbuilding Company was given at Kinsley's, in that city, on the 2d inst., by the directors of the Lake Michigan & Lake Superior Transportation Company. W. I. Babcock, general manager of the Shipbuilding Company, was presented a silver dinner set by the steamboat people as a token of his "skill and efficiency in the construction of the steamship 'Manitou.'" Among those present at the dinner were: W. L. Brown, Major H. S. Pickards, Walter F. Cobb, C. F. A. Spencer, A. T. Spencer, Joseph Austrian, Capt. Allen McIntyre, S. F. Leopold, Nathan F. Leopold, Alfred F. Leopold, W. I. Babcock, Joseph Berolzheimer and Capt. F. D. Herriman.

Electricity as a motive power is being tried on the Erie Canal this week, the Pittsford level, near Rochester, N. Y., being selected for the experiment. The work is being done by the Westinghouse Company of Pittsburgh.

Pig Iron Production Increases.

The tide has turned, there being a tendency to increase the production of pig iron from the lowest notch which it has touched for a good many years. The principal increase has taken place in the Central West, where the resumption of so many steel works and rolling mills has induced their owners to resume work at the blast furnaces which form a part of the plant. Since November 1, on which our report is dated, there have been further additions, and it is known that others will follow before the end of the month. Thus far this movement is practically confined to the Pittsburgh and its tributary districts, the Mahoning and Shenango valleys and the Wheeling section. In the East and South there has also been a movement, less pronounced, toward a heavier production, but the Northwest still lags.

Illinois, Missouri, Wisconsin, Minnesota and Indiana still fail to record a single coke furnace running. The starting of the steel works may, however, soon bring a change.

On November 1 the active furnace plant, grouped according to fuel used, possessed the following weekly capacity:

Fuel.				
Anthracite	34	16,166		
Coke	57	58,820		
Charcoal	26	5,084		
Total, November 1	117	80,070		
Total October 1	114	73,895		
Increase	+ 3	+ 6,175		

The weekly product of all the furnaces on November 1 compared as follows with that of preceding periods:

	Furnaces in blast.	Capacity per week.	Gross tons.
November 1, 1893	117	80,070	
October 1	114	73,895	
September 1	125	88,434	
August 1	169	107,042	
July 1	220	133,762	
June 1	244	174,029	
May 1	251	181,551	
April 1	255	178,838	
March 1	255	176,978	
February 1	251	171,201	
January 1	246	173,068	
December 1, 1892	246	176,271	
November 1	244	171,082	
October 1	236	158,027	
September 1	136	151,643	
August 1	138	155,138	
July 1	254	169,151	
June 1	269	173,674	
May 1	268	177,886	
April 1	280	185,492	
March 1	305	193,902	
February 1	308	187,383	
January 1	305	188,082	
December 1, 1891	298	188,135	
Totals	260	57	58,820
			203
			142,394

The status of the anthracite furnaces was as follows:

Anthracite Furnaces, November 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York	18	2	1,134	16	5,519
New Jersey	11	3	1,056	8	3,150
Spiegel	3	2	149	1	118
Pennsylvania:					
Lehigh Valley	44	11	3,986	33	12,536
Spiegel	1	0	0	1	61
Schuylkill Valley	27	9	4,832	18	7,910
U. Susquehanna Valley	14	2	915	12	4,275
L. Susquehanna Valley	17	2	1,668	15	5,490
Lebanon Valley	15	3	1,826	12	5,470
Totals	160	34	16,166	116	44,539

For a number of months past our records of active anthracite furnaces show the following:

	Furnaces in blast.	Capacity per week.
November 1, 1893	34	16,166
October 1	34	15,338
September 1	43	20,768
August 1	51	23,572
July 1	63	20,268
June 1	70	38,916
May 1	67	38,168
April 1	72	34,641
March 1	74	34,773
February 1	74	32,871
January 1	70	32,772
December 1, 1892	89	29,802
November 1	89	30,869
October 1	89	29,958
September 1	66	27,453
August 1	66	28,821
July 1	72	31,754
June 1	76	33,210
May 1	81	35,473
April 1	84	36,487
March 1	89	38,678
February 1	92	38,124
January 1	94	38,307
December 1, 1891	85	34,905

Edgar Thomson and one Monongahela furnaces were started. In the Mahoning Valley Grace and Hazelton were no producing on the 1st inst., but Hubbard and Mary are active.

In the South, the Woodward in Alabama, Citico in Tennessee and Ivanhoe in Virginia blew in during October. Big Stone Gap, however, stopped work.

The condition of the charcoal furnaces was as follows:

Charcoal Furnaces, November 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England	13	5	390	8	570
New York	5	0	0	5	585
Pennsylvania	13	2	154	11	761
Maryland	6	2	125	4	300
Virginia	13	0	0	13	327
Ohio	9	4	317	5	263
Kentucky	3	1	81	2	200
Tennessee	8	2	660	6	396
Georgia	3	1	254	2	230
Alabama	13	3	651	10	2,540
Michigan	20	3	1,110	17	5,111
Missouri	2	1	340	1	293
Wisconsin	4	1	747	3	1,127
Texas	4	0	0	4	603
Washington	1	0	0	1	100
Oregon	1	1	225	0	0
Totals	118	26	5,084	92	13,906

As compared with previous months, the record of active charcoal furnaces stands as follows:

Furnaces in blast.	Capacity per week.
November 1, 1893	26
October 1	28
September 1	28
August 1	34
July 1	35
June 1	34
May 1	33
April 1	33
March 1	36
February 1	37
January 1	38
December 1, 1892	41
November 1	42
October 1	39
September 1	42
August 1	41
July 1	42
June 1	48
May 1	41
April 1	44
March 1	50
February 1	49
January 1	48
December 1, 1891	52

During October Shelby in Alabama and Olive in Ohio went out. Muirkirk in Maryland stopped on the 2d inst., while Union in Michigan blew in on the 3d inst. to work up the existing stock of ore and charcoal.

Stocks.

The position of stocks, sold and unsold, as reported to us November 1, was as follows, the same furnaces being represented as in former months:

Stocks:	Aug. 1.	Sept. 1.	Oct. 1.	Nov. 1.
	Tons.	Tons.	Tons.	Tons.
Anthracite pig	111,488	115,930	121,597	134,137
Coke pig	420,390	513,260	532,157	503,806
Charcoal pig	191,888	197,881	199,008	200,450
Totals	723,696	827,071	852,762	888,413

The prolonged suspension of operations on the part of a large number of coke producers is beginning to have its effect upon the stocks of coke pig carried, but returns show that during October a decrease of 28,351 tons took place, bringing the figure down to 503,806 tons, as compared with 532,157 tons on October 1. Mahoning Valley reports a decrease of 9500 tons and New York State and the Shenango Valley 5000 tons each. Alabama, Virginia and Kentucky also report a falling off. The anthracite furnaces have increased their holdings by 12,560 tons, while the charcoal producers have added 1442 tons to their stocks.

During October, Clinton in the Pittsburgh district was banked, but two

The Foundrymen's Association.

The annual meeting of the Foundrymen's Association was held at the Manufacturers' Club, Philadelphia, on Wednesday, November 1, with a large attendance of members. The president, Francis Schumann, occupied the chair. The secretary, Howard Evans, announced the death of Daniel L. Dawson of the Gray's Ferry Foundry & Boiler Company, Limited, Philadelphia, a member of the association well known among the iron trade and in literary circles. The treasurer, Josiah Thompson, presented his report for the past six months, showing that his total receipts had been \$848.89 and his payments \$609.98, leaving a balance in hand of \$238.91. On motion the report was filed and ordered to be spread upon the minutes.

Geo. P. Smyser of E. G. Smyser's Sons, York, Pa., representing the structural iron work section of the Price Committee, reported that his section had had one meeting and another had been called, but fell through, owing to non-attendance of members. It was arranged to hold another meeting next week, and he could say for his section that it was getting along very nicely. R. A. Register of Register & Sons, Baltimore, Md., representing the cast iron soil pipe section of the committee, reported progress.

P. D. Wanner of the Mellert Foundry & Machine Company, Reading, Pa., for the cast iron pipe section of the committee, reported that there had been no regular price for cast iron pipe during the last month or so. He said they were now reaching the end of the season and cast iron pipe was, as a rule, lower at this time than during the summer or fall. It had lately been sold and offered for delivery in the interior of the State of Pennsylvania at prices less than 1 cent per pound, prices at which it could not at the present time be made. In other words, he said, it was being sold at prices very considerably below cost. In his opinion this proceeding was wrong. He believed he knew something about pipe making and was in a position to know that it was being sold below cost. Whether it was done to keep shops going or to relieve financial difficulties, he could not say, but believed it to be a wrong course in either case. When manufacturers turned out goods for sale at prices below cost and failed, they had been drawing on the people to whom they were indebted, which in his opinion was wrong and simply constituted robbery. If the association was to do good to its members and good for the community, it appeared to him advisable in matters of this kind to talk plainly.

The president then delivered the following address:

"To-day is the third anniversary of our association. I avail myself of this occasion to briefly address you upon our condition, and to state my views as to our future conduct and policy.

"During the past year we have continued to grow steadily, both in membership and stability. We are gradually uniting the foundrymen throughout the country for their common interests. We have set the example for the creation of similar associations in other and distant sections of the country, and our members are experiencing the beneficial effects of the unity of action due to organization, and thus the first and most important result has been attained.

"We have, during the year, informally discussed the desirability of combining all similar associations that may exist

or be formed throughout the country under one parent head, to and from which all matters affecting our welfare radiate. That such an organization, national in character, would be of vital importance none of us will deny, and it remains but to determine the details and methods to effect this.

"I would suggest that, after we have passed through the present depressed state of business, a call be issued by this association for a congress of the different organizations, as well as to foundrymen in general, to meet at some central point for the purpose of forming a national organization, of which the local associations shall form chapters or subordinate branches. The local associations to be independent of each other, but acting in unity with and through the parent association, from which all principal matters shall emanate. The parent body to be composed of representatives from the various chapters, to be elected by the respective chapters annually. Each chapter to be entitled to one representative for any fraction of each one hundred *bona fide* members. These representatives to elect a president, vice-president, secretary and treasurer at an annual convention held at different points from year to year. These officers, beside five members elected at these meetings, to constitute an Executive Committee, who shall meet monthly and act upon all matters affecting the interests of the association. The expenses of the parent body to be borne by the chapter, *pro rata*, according to the number of representatives. I advance the foregoing as mere suggestions, with the hope that the importance of the subject will be appreciated and fully discussed.

"It has occurred to me that, possibly, among the causes for the excessive competition in our business is the variable judgment applied in classifying work and the liberty so often permitted unscrupulous parties to vary from the specifications, always to the disadvantage of *bona fide* bidders and tending to inferior work. Especially is this the case with municipal work, the quality and rates paid being really deplorable. We as an association should insist on a rigid inspection, which, if properly applied, would soon correct the evil.

"The benefits to us from such inspection are readily understood when we turn to Government work, as an example, which is now carefully inspected and commands much better prices, no one now being so bold as to cut prices on the assumption that he could cut the quality of the work accordingly.

"Proportionately with the growth of the country less castings are used to-day than formerly. Especially is this so with structural work. Hardly any castings are now used in bridges; wrought iron columns are gradually superseding cast; rolled beams have almost entirely taken the place of cast iron girders and lintels, and even stairs are now largely made of wrought iron and slate or marble. Even cast pipe is meeting with competition from wrought or rolled pipe. These gradual changes are felt and must be met.

"The present severe business depression is keenly felt in our and kindred industries, and unfortunately intensifies the evil of unhealthy competition in the anxiety to obtain work at any price, thus seriously interfering with the plans of our association and tending to nullify our acts.

"If the values in our country are undergoing a readjustment, which I much fear, we will be compelled to adjust

the prices paid and received by us to suit the new order of things. Even now, taking our industry as a whole, it is not profitable, taking into consideration the close application, special knowledge required and risks connected therewith as compared to other industries. The question of what we pay and what we receive for our product is one that must receive the consideration of foundrymen in the near future, and one that should be discussed in a convention as I have suggested.

"I would also repeat my suggestion of the importance of the organization under each association of the different branches of our industry, such as pipe makers, structural work, machine castings, malleable castings, &c. While this division has been discussed no decisive action has been taken.

"We must employ all means possible to make our monthly meetings interesting, and I desire to impress upon the Executive Committee the importance of proceeding as they so well began in this direction -- the discussion of subjects of general interest, which, besides papers obtained from qualified persons upon subjects bearing on our industry, either directly or indirectly, could be published annually for our use.

"The beneficial effects resulting from this association have been felt by many of us, and not one will deny its value, but, on the contrary, will help to maintain it in the future, especially through these trying times, which will pass away as sure as sunshine follows storm; so will we emerge from the difficulties now before us, and do our share toward the development of our great country, bearing in mind that the healthy growth of our industry, as well as that of our country, depends on united and comprehensive action based on patriotism, good will and good faith between us."

Election of officers for the ensuing year being next in order, and the by-laws of the association requiring nomination at one meeting and election at a subsequent meeting, it was on motion resolved that the by-laws be suspended on this occasion, and that the nomination and election of officers be proceeded with.

Justice Cox, Jr., nominated for re-election the present officers and Board of Directors of the association. These gentlemen, he said, had filled their positions with such credit, not only to the association but to themselves, that it would be hardly fair at this time to think of putting others in their places. He considered that the work they had done had been done so well and so cheerfully that it would not be courteous to think of electing others in their places. He felt sure that the members would share his views in the matter. This nomination being seconded and nominations closed, the following gentlemen were re-elected: President, Francis Schumann of the Tacony Iron & Metal Company, Philadelphia; vice-president, Thos. Devlin of Thos. Devlin & Co., Philadelphia; treasurer, Josiah Thompson of I. S. Cassin & Co., Philadelphia; secretary, Howard Evans of J. W. Paxson & Co., Philadelphia.

Executive Committee: Walter Wood of R. D. Wood & Co., Philadelphia; Thos. Glover of Glover Bros., Frankford, Philadelphia; L. B. Whitney of A. Whitney & Sons, Philadelphia; H. C. Vansant of Morris Tasker & Co., Incorporated, Philadelphia, and Stanley G. Flagg, Jr., of Stanley G. Flagg & Co., Philadelphia.

Under the head of unfinished business the subject of obtaining chemical determinations at low rates was again

taken up. The secretary stated that he would like to know from foundrymen individually the number, as nearly as possible, of determinations they would be likely to require in the course of a year, with the idea of getting a basis for a price. He said that there were one or two institutions willing to equip for the purpose of making determinations for the association. An arrangement of this kind, he thought, would serve to make a membership in the association valuable, and present opportunities for procuring determinations at very much lower prices than those generally ruling. Of course, he said, such an arrangement would not be acceptable to those having chemists in their employ, but to an ordinary foundryman who might wish to know the character of the iron he was using or the castings he was making a few determinations would be valuable, and it was for members of this class that facilities for determinations were sought. In the regular invitations to this meeting the question "How many determinations would you require?" was asked, but only a few had responded. He read a few of the replies he had received. One from a firm in Cleveland, Ohio, expressed doubt as to the proposed arrangement proving to the advantage of members at a distance. In regard to this the secretary explained that the only delay to members at a distance would be the time occupied in the transmission of samples and instructions by mail, and that as far as Cleveland was concerned, any matter mailed in that city before 6 p.m. would reach Philadelphia the next day. Very little delay, therefore, would result in the case of determinations required by distant members.

A lengthy discussion then took place on the practicability and advisability of making arrangements for chemical determinations. The president suggested that furnace men send out with their iron a statement or schedule of the elements contained in such iron, free carbon, combined carbon, sulphur, phosphorus, manganese, &c., and in a column set apart for the purpose state which of such elements would induce hardness, softness, fluidity, strength, chilling, density, shrinkage and so on. A foundryman would in this way get to know what to look for in his irons. When, in purchasing iron, a furnace man claimed that his iron contained certain percentages of silicon or manganese, the foundryman could say at once that it would not do, as he was making tough castings and wanted a very fluid iron. In this way the foundryman would get an idea as to the elements he should have in his iron.

Justice Cox, Jr., thought a statement such as suggested could be given by furnace men and it would naturally educate the foundryman in chemistry. It would tell him what elements would be required to get fluid iron, shrinkage and other effects. The furnace man, he said, had got to that at the present day through his chemist, and could say that he made iron by rule and knew that if he used certain kinds of ore, limestone and fuel a certain iron would result. If furnace men, he said, would get up a card or statement it would be a good thing.

J. Birkinbine remarked at length upon the subject. In his opinion the foundryman should establish a standard in order that the pig iron men might produce the iron he required. In regard to chemical analyses he thought the association was pursuing a wrong

course in seeking to get their determinations through educational institutions. He explained the necessity of having analyses of an exact character, and pointed out that the professional chemist could make determinations quicker and at much less expense than could students, owing to his familiarity with his work and his knowledge of short cuts, only known to experts, for quickly determining the existence and quantities of certain elements. He did not wish to be understood as disparaging the capabilities of the University of Pennsylvania and the Drexel Institute for making determinations, but was sure that men who made such work a specialty would make analyses the cheapest. He had occasion, he said, some time ago to have some 400 analyses made, but when he started he thought 100 would answer his purpose. He made an arrangement with a Philadelphia testing laboratory practically on the basis of quantity reductions; for instance, if given a certain amount of work, a certain reduction was to be made, and if further work, a further reduction. He believed it would be practicable for this association to make an arrangement with a reliable man in Philadelphia. They could propose to him that he be appointed the chemist of the association, to do their work, and that he give them his regular terms, so that he would not be doing an injustice to other patrons. He could then be asked what discount he would allow for a certain amount of work per month, and thus get terms based on the amount of work per month given to him. In this way, he thought, a satisfactory arrangement could be made if all in the association would agree to use that chemist. Mr. Cox thought Mr. Birkinbine's suggestion a good one. He believed such an arrangement could be effected, and it would not be necessary to guarantee any amount of work to the chemist. It was simply necessary, he said, to make an arrangement for one chemist to do the work of the association, and if he made one analysis it would be so much, if two so much less, and so on from month to month. In some months the number of analyses would be greater than in others.

Mr. Riehlé then made a motion that the secretary put himself in communication with some of the best known chemists in the city, with the view of getting their rates for analyses in quantities, the quantity made in one year to determine the price.

Mr. Flagg seconded the motion, which, on being put to the meeting, was carried unanimously.

The meeting then adjourned to the roof garden of the club, where a supper was served and an hour or two pleasantly passed.

Secretary Herbert has selected a special board to inquire into the best and most economical method of correcting the defects reported to be existing in some of the vessels of the new navy. The duty of the board will be to determine which should be adopted of the several plans submitted to the Navy Department for the redistribution or reduction of weights, &c., so as to correct the top heaviness discovered in the vessels. The ships included in the list to be investigated are the "Detroit," "Montgomery," "Machias," "Marblehead," "Castine," "Cincinnati," and "Raleigh," but it is possible that the work of the board may be extended so as to include all the vessels now under construction.

MANUFACTURING.

Iron and Steel.

The executive officers of the Carnegie Steel Company, Limited, at Pittsburgh, have been at work for some time preparing a wage scale to govern wages to be paid at the Homestead Steel Works, Homestead, Pa., after January 1, 1894. An official of the concern is on record as saying that the terms of the new wage scale will be kept secret, as the firm do not propose to furnish information to other manufacturers regarding wages paid at any of their plants.

It is stated that at a recent meeting of the directors of the Cambria Iron Company, Johnstown, Pa., held in Philadelphia, steps were taken looking to a large increase in the capital stock of the concern. It is also stated that improvements are contemplated which will result in the expenditure of a large amount of money.

The Reading Rolling Mill Company, Reading, Pa., have notified their employees that, in order to keep the plant running, it will be necessary to make a reduction of 10 per cent. in wages, and also to reduce the puddlers to \$3 a ton.

Recently suit was entered by the Pittsburgh Iron & Steel Engineering Company, engineers and contractors, Pittsburgh, against the West Superior Iron & Steel Company, West Superior, Wis., to recover \$61,615, which is the balance claimed to be due on an account amounting originally to \$349,600. It will be remembered that the first named concern erected the Bessemer steel plant of the West Superior Iron & Steel Company, and the contract price has been paid with the exception of the amount for the recovery of which suit has been entered. The concern made an assignment several months ago and their plant has since been closed down. It is expected that the trial of this suit will bring up some very interesting legal points, as the New York Central Trust Company, who negotiated bonds for the West Superior Iron & Steel Company, will contest the suit. It is stated that the firm were organized in Minnesota and the bondholders are responsible for their debts even after the assignment had been made.

It is stated that the Indiana Iron Company, Muncie, Ind., have made a proposition to their employees to pay wages based upon the Amalgamated Association scale, but have refused to sign the scale. As yet the men have not accepted this proposition, and the plant is still idle.

Douglass Furnace, at Sharpsville, Pa., formerly operated by the Douglass Furnace Company, has been lighted up under the management of Corrigan, Ives & Co., Cleveland, Ohio.

Stewart Furnace of the Stewart Iron Company, Limited, at Sharon, Pa., has been started up after being banked ten weeks. The rolling mill of this firm continues idle, with no prospects of immediate resumption.

R. C. Neal has been appointed receiver of the Harrisburg Rolling Mill Company, Harrisburg, Pa., which corporation was affected by the embarrassment of the Tube & Iron Company at Middletown. It is understood that this is a move toward resumption. About half the employees were ordered to report for work. The mills have been shut down three months.

A dispatch from Steubenville, Ohio, says that the Mingo Steel Works, after a two weeks' shut down, have resumed.

One of the pipe foundries of the Mellert Foundry Company of Reading, Pa., has shut down indefinitely.

Furnaces Nos. 2 and 3 of the open hearth mill and the Krupp washer department, at the Cambria Iron Works, Johnstown, Pa., have resumed work.

As showing the falling off in the product of some mills during the past two or three months, compared with the same periods of last year, we cite the case of the Akron Iron Company of Akron, Ohio. In October of last year this firm turned out 2000 tons of finished product, while in the same month of this year their output amounted to only 178 tons. This concern signed the Amalgamated Association scale in July, so that it could run without interruption. However, the falling off in orders was so great that

their plant has not been operated to anything like its full capacity for the past three or four months.

At the request of the bondholders, the sale of the property of the Brady's Bend Iron Company, at Kittanning, Pa., which was to have taken place last week, has been postponed to December 1.

The new corporation formed to take over the rolling mill of the Chicago Steel Works, at Chicago Heights, Ill., will be named the Inland Steel Company and incorporated under the laws of Illinois, with a capital stock of \$130,000. Steps are now being taken to complete the organization and get the affairs of the concern in proper shape.

It has been stated by the Girard Iron Company, Girard, Ohio, that the Biwabik ore, which has been used in the blast furnace of that concern for some time, required for its reduction 15 per cent. less coke than the mixture previously used.

Furnace No. 2 of the Carrie Furnace Company of Pittsburgh, which has been idle for some months, will probably resume blast during this month.

Advices from Columbus, Ohio, state that the Farmers' Loan & Trust Company of New York City have asked that a receiver be appointed for the Consolidated Wellston Coal & Iron Company of Ohio, who, as alleged, have defaulted in the interest on \$5,000,000 worth of bonds since April 1, 1888. The property was transferred by the company to Francis Hinckley of Chicago, who promised to pay the interest on the bonds and take care of the principal, but it is claimed has not done so.

Sharon Furnace of the Sharon Iron Company, Limited, at Sharon, Pa., which has been idle for some months, resumed blast on Wednesday, the 1st inst.

The plant of the Johnson Company, Johnstown, Pa., manufacturers of street railway supplies, which has been in only partial operation for some months past, has resumed operation to nearly full capacity in all departments.

We are advised that the statement that the Penn Nail Company, Limited, Lancaster, Pa., had decided to close down their entire plant on account of lack of orders is without foundation. This concern are operating their plant entirely upon orders, and while these are not sufficient to warrant full operations in all departments the concern have no intention whatever of closing down, as they expect to be able to operate their plant right along, though not to full capacity.

The Irondale Rolling Mills, at Anderson, Ind., have been destroyed by fire at a loss of \$40,000.

The Brilliant Iron & Steel Company, Brilliant, Ohio, have signed the Amalgamated Association sheet iron scale, and notified their employees, about 600 in number, to report for work at once. The plant has been idle for over four months.

The Syracuse Steel Wire Company have been incorporated under the laws of New York State, to manufacture steel wire in Syracuse. The company have a capital of \$20,000.

The Fort Payne, Ala., furnace has been sold at public auction to N. W. Trimble for \$30,000. It is understood that the purchaser represented the bondholders.

The plant of the Hollidaysburg Iron & Nail Company, at Hollidaysburg, Pa., has resumed operations.

A Toronto, Ont., newspaper states that James Worthington, president of the Ontario Bolt Works Company, is reported to be negotiating for the purchase of the Ontario Rolling Mills, at Swansea. It is understood that \$100,000 is the price asked.

The Hercules Iron Works, at Aurora, Ill., have resumed work with a small force. A number of orders are on hand, and employment will be given to a large number of additional hands at once.

The puddling mill of the Pennsylvania Bolt & Nut Works, at Lebanon, Pa., has closed down for an indefinite period. When operations are resumed it is stated that a lower scale of wages will go into effect.

It is stated that the Parkesburg Iron Company, at Parkesburg, Pa., have announced a general reduction of 20 per cent. in wages.

A number of additional departments of the plant of the Cambria Iron Company, at Johnstown, Pa., which have been idle for several months past, were put in operation on Monday morning, the 6th inst. The starting up of these departments will give employment to some 200 additional men.

Announcement is made that the entire plant of the Pennsylvania Steel Company, at Steelton, Pa., will be put in full operation during this week, with good prospects of full capacity being employed right along.

The puddling department of the plant of the Brilliant Steel & Iron Company, at Brilliant, Ohio, was put in operation on Monday, the 6th inst., on a contract for 1000 tons of muck bar. As yet it is uncertain when the finishing department of this plant will be started up.

Machinery.

A paragraph printed in the first column of *The Iron Age*, page 744, issue for October 26, 1893, erroneously stated that the patterns for deep well pumps formerly manufactured by the Bradford Well & Pump Company of Cincinnati, Ohio, had been purchased by other parties, together with sundry other apparatus, &c. The patterns in question are still in the possession of the Bradford Well Supply Company, who made the purchase from the late firm of Bradford Well & Pump Company at a recent sale.

The P. H. & F. M. Roots Company of Connersville, Ind., who have been makers of rotary blowers for 33 years, have recently established a branch office in Chicago at 501 Manhattan Building.

The plant of the Westinghouse Air Brake Company of Wilmerding, Pa., which has been entirely closed down for about a month, resumed operations on Monday, the 6th inst. The works will be operated four days per week of seven hours each.

The Rice & Whitacre Mfg. Company's stock, machinery, tools, fixtures, patents, &c., are offered for sale by the receiver, F. B. Dyche, at 43 to 47 South Canal street, Chicago. Bids will be received up to 12 o'clock, noon, on the 20th inst.

Kenneth Torrance, M. E., has established an office in Room 1437 Monadnock Block, Chicago, for the sale of the Cochrane heater and separator, made by the Harrison Safety Boiler Works of Philadelphia, and also the Duval metallic packing and the specialties manufactured by the Hendrick Mfg. Company of Carbondale, Pa. Mr. Torrance was formerly connected with the Chicago office of Henry R. Worthington, has had experience of a practical character in varied technical work and offers his services as consulting mechanical engineer.

The Buckeye Engine Company, Salem, Ohio, recently made a sale through their agents, Bagnell & Hillis, Yokohama, Japan, to the Electric Light Company of Manila, Philippine Islands, of six compound engines, each having a rated 200 horse-power capacity, the cylinders being 13 and 22½ inches diameter by 18-inch stroke. Four of these engines have already been shipped to the above place and the final shipment of the other two will be made during this month. The plant is quite a large one, and on account of its size and location competition among engine makers for this order was very severe. It is understood that the Brush electrical machinery will be used in connection with the engines, and the lights are to be both arc and incandescent, the intention of the firm being to furnish street as well as commercial lighting. The Buckeye Engine Company have already supplied quite a number of electrical plants in Western Asia with power, and naturally view with considerable satisfaction their growing trade in that direction.

Wm. Tod & Co., founders and machinists, Youngstown, Ohio, are operating their several departments, though not to full capacity. The firm have quite a number of small orders on hand and expect to be able to maintain their present active capacity throughout the winter.

At the plant of the Erie City Iron Works, Erie, Pa., manufacturers of boiler and other machinery, additional departments have recently been started up, and the outlook for future operations is considerably brighter than for some time past. This concern are now giving employment to about 450 men, their plant being in operation six days per week of eight hours each.

The Leechburg Foundry & Machine Company of Pittsburgh recently shipped a Mesta patent automatic pickling machine to the Whitaker Iron Works, Wheeling, W. Va., and a 36-inch trimming shear to Marshall Brothers & Co., Philadelphia.

In January last the Atlantic Works and the Robinson Boiler Works of Boston, Mass., were consolidated, and work begun on a new building for the manufacture of

boilers. This building has just been completed. It is constructed of brick and iron, and is 100 feet wide by 325 feet long, with a riveting tower 28 x 38 feet, making the total floor area 23,500 square feet. The additions and changes made to the plant represent an outlay, it is stated, of about \$200,000.

The creditors of the Carthage, Mo., Foundry, have decided to ask for the appointment of a receiver to wind up their affairs.

The New York Engineers' Supply Company have been incorporated at Albany, N. Y., for the purpose of manufacturing and selling boilers, engines, pumps and machines.

The foundry and machine shops of E. C. Wehrfritz, at Little Rock, Ark., have been destroyed by fire, supposed to have been of incendiary origin. Loss, \$40,000; insurance, \$6200.

The molders and polishers of the National Brass & Iron Works, at Reading, Pa., have been placed on piece work on a scale equal to a 10 per cent. reduction.

Wells & Coutan Company, Limited, 29-31 Gold street, New York, are directing the attention of the trade to the fact that their business is of a threefold character—viz., manufacturing high grade steam gauges, which is done on the premises; exclusive importation of the Thistle gauge glass and the representation of J. E. Loran-gan & Co. for the sale of their pot safety, water relief and snifter valves.

Hardware.

Cowles Mfg. Company, Kansas City, Mo., a concern recently organized, are building a factory for the manufacture of a mechanical device for feeding threshing machines. This machine is designed to cut the bands and separate the grain in the bundle, giving a regular feed to the thresher. About 15 men will be employed when the factory is completed.

The works of the Birmingham Hardware Specialty Company, East Birmingham, Ala., have resumed operations, giving employment to about 30 men.

The Glade Axe & Tool Works, Warren, Pa., which have been in operation since June, are about to be reorganized into a stock company for the purpose of enlarging the plant. The works have employed 25 skilled workmen, and the extension of plant will increase the force to 50.

The W. D. Gibson Company, Chicago, Ill., manufacturers of crucible spiral springs, advise us that their business is rapidly picking up. The company have received World's Fair award for their exhibit of springs for all purposes.

The factory of Newhall & Stebbins, Hinsdale, N. H., has started up with something less than their usual force.

A. D. Goodell of Worcester, Mass., contemplates engaging in the manufacture of mechanics' tools and several specialties at Shelburne Falls.

The Automatic Clothes Line Company, Austin, Texas, have been incorporated. The capital stock is \$30,000. The incorporators are Fred. Sterzing, John W. Kelly and Ed. G. Lane, all of Austin.

The Dunham Nut Company, Unionville, Conn., have commenced to fit up their new factory and expect soon to move in machinery.

The National Wheel Company, Jackson, Mich., have resumed operations.

The Burton Magazine Gun Company have been incorporated to manufacture magazine guns in New York City. The capital is \$10,000, and the directors of the company are Eugene Durnin, Peter A. Hendrick and Benjamin Yates, all of New York.

The Consolidated Lamp & Glass Company is the title of a corporation which has just been chartered under the laws of West Virginia, and which will have headquarters in Pittsburgh. The paid up capital stock is given as \$200,000, with the privilege of increasing it to \$250,000. The following officers have been elected: F. G. Wallace, president; J. B. Graham, secretary; Jos. G. Walter, treasurer, and N. Kopp, manager. The new concern expect to have their goods on the market not later than January 1 next. Negotiations are now in progress looking to the purchase of a large plant, to which additions and alterations will be made. The principal warehouse will be located in Pittsburgh, and the general offices will also be in that city. It is the intention of the new concern to not only manufacture the glass and porcelain

portions of lamps, but also all the other parts, including the brasses.

Humason & Beckley Mfg. Company's cutlery, factory at New Britain, Conn., is now running three days a week with a full force.

The bolt works of Clark Bros. & Co., Milldale, near Southington, Conn., were burned on Friday last. The office and packing room, which were in a separate building, were saved. The fire started in the forging room, and as the works were beyond the water works' line, the firemen could do nothing but save adjoining buildings.

MISCELLANEOUS.

Randolph & Clowes of Waterbury, Conn., are making considerable improvements in their plant in many directions. They have recently established a department for the manufacture of plumbers' materials and supplies. They are using for this purpose a portion of the buildings which have remained unused heretofore since the time of Brown & Bros. This department has only been started this year. They have facilities for the turning out of new patterns and designs for such things as lavatory legs and brackets. Their operations in this direction are facilitated by their having in their mill departments which furnish brazed tubing of the newest designs and moldings. They have recently taken out a patent in connection with this department for a plumbers' ferrule, of which, although on the market for a very short space of time, they are already making large sales.

The Scovill Mfg. Company of Waterbury, Conn., manufacturers of brass, German silver and aluminum, have issued a short catalogue referring to their aluminum fancy goods, including watch safes, vases, paper knives, smokers' sets, cigar cases, shaving cups, mirrors, easels, puff boxes, trays, picture frames and napkin rings.

The Pittsburgh Reduction Company of Pittsburgh, manufacturers of pure aluminum, have awarded a contract for the buildings for the new plant which this concern propose to erect at Niagara Falls. Jas. Stewart & Co. of Niagara Falls were awarded the masonry contract, while the structural iron work will be done by Debbie & Stewart of the same place.

Among recently authorized corporations in Illinois are the following: United States Vise & Pipe Wrench Company, Chicago; capital stock, \$25,000; incorporators, Charles A. Petterson, Andrew Hallner, Class Roberg and Adolf F. Bergborn. Fowler Foundry Company, Chicago; capital stock, \$50,000; incorporators, H. R. Pebbles, Colin C. H. Fyffe and Howard D. Headley. A. Boyce Foundry & Machine Works, Bunker Hill; capital stock, \$25,000; incorporators, Arthur Boyce, John R. Richards and George T. Dright.

The Mount Clare repair shops of the Baltimore & Ohio Railroad, at Mount Clare, Md., have closed down. It is understood that this action precedes a general reorganization and concentration of the road's extensive repair system.

It is announced that the Lebanon Chain Works, at Lebanon, Pa., have received the contract from the United States Government to manufacture chains for light vessels, the amount of the contract being \$10,000.

The citizens of Memphis, Tenn., are displaying great enthusiasm and holding mass meetings because a local land syndicate has persuaded the Litchfield Car & Machine Company of Litchfield, Ill., to remove their plant to Memphis. The "persuasion" used was in the form of a liberal donation of land and a bonus of \$125,000 cash, and other minor considerations. Whether the enterprise will prove "the dawn of a new era" for Memphis or only the usual land boom scheme remains to be seen.

The New York bonded warehouses, which have been for months full to overflowing with foreign goods, whose owners were either unable to pay the duty or were awaiting the Senate's action on the Repeal bill, are beginning to feel a relief from their congestion.

The rush of foreigners to visit the World's Fair did not assume anything like the proportions expected. Steamship agents in New York estimate that not more than 25,000 World's Fair visitors passed through this port during the time the exposition was open.

TRADE REPORT

The event of the week has been the confirmation through actual sales of reports current for some time past that a heavy cut in prices has been made in Steel Rails. The war of the giants is now begun, the initiative having been taken by the Pittsburgh concern, which has been trying to capture trade in Eastern territory. It is fair to quote \$24 @ \$25 at tidewater now, a clean cut of \$5 $\frac{1}{2}$ ton under the price which has nominally ruled so long. It has been an open secret that by a variety of devices the \$29 rate had been shaded for a long time.

It should be stated that the price was never at any time during the life of the association a part of the signed agreement under which it was working, although an informal understanding did exist at times. It is true also that the association is intact to day, and will remain so until the expiration of the present contract. Whether the latter will be renewed is doubtful, since the Pittsburgh interest has declined advances in that direction. Those interested in the market should consider that there is always the contingency of a renewal of it, as the result of an exhausting fight.

It may be frankly acknowledged that in the Iron trade generally the Rail Association has always been a pretty unpopular organization. Its existence has been embarrassing in more ways than one. The Soft Steel makers have suffered from the competition of some of the Rail mills who have taken Billet business at low prices to keep going during times of idleness in the Rail trade.

The effect of the break in Rails is expected to be favorable to other branches. It is sure to lead to the placing of a far more liberal volume of orders for Rails which will first clean up the accumulated supplies of Pig Iron at the Rail mills, and then will create a larger demand for Ore and Coke. It seems probable that the outcome will therefore be a strengthening of the markets of raw material as the first step toward a return to living rates for Iron and Steel.

The production of Pig Iron is on the increase again, the additions to the capacity at work in the Pittsburgh, Shenango, Wheeling and Mahoning districts being in response to a larger volume of business of the rolling mills and Steel works.

In the West, and to a limited extent in the East, the volume of orders is larger, but as yet the lowest prices reached are still the basis of business. Whether the Western mills will ease their pressure upon the Eastern markets soon remains to be seen. Until now they have not done so.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, Chicago. November 8, 1893.

The volume of business continues to increase and orders are getting larger. There is no question that confidence has been restored to a great extent and buyers have no hesitation in anticipating their wants to a moderate degree. A much better feeling prevails in all circles, unless it is in Shelf Hardware, which is affected by the restriction in building operations.

Pig Iron.—A perceptible improvement is seen in the demand. It is especially noticeable in local Coke. Several contracts for round lots have been placed, indicating some revival in activity. The week has developed more inquiry, and business is particularly good in small orders for quick delivery, showing that consumers' stocks are light. It is believed that such stocks are smaller than ever before. The foundries that have been running for some time on their own Scrap or rejected Castings have about run out of that material, and are now obliged to come into the market for fresh supplies of Pig. The Southern furnace companies report a decided improvement in inquiries from the different localities in which they sell, although in this market the demand for Southern Iron has been somewhat quiet for the past week. A better movement is also observed in Lake Superior Charcoal Iron. The low sales made some time back are not being duplicated, but the furnace companies are getting better prices, and seem to have been able, at least, to get control of the value of their product. Sales of several round lots have been made at prices but a shade under \$16. Quotations are now as follows for cash:

Lake Superior Charcoal.....	\$16.00 @	\$16.50
Local Coke Foundry, No. 1...	13.50 @	14.00
Local Coke Foundry, No. 2...	12.75 @	13.00
Local Coke Foundry, No. 3...	12.25 @	12.75
Local Scotch.....	14.00 @	14.50
Ohio Strong Softeners No. 1...	15.50 @	16.00
Southern Silvery, No. 1.....	@	14.50
Southern Silvery, No. 2.....	@	14.00
Southern Coke, No. 2.....	12.10 @	12.35
Southern Coke, No. 3.....	11.35 @	11.60
Southern, No. 1, Soft.....	12.10 @	12.35
Southern, No. 2, Soft.....	11.35 @	11.60
Southern Gray Forge.....	10.85 @	11.10
Tennessee Charcoal, No. 1...	16.00 @	16.50
Alabama Car Wheel.....	18.50 @	18.75
Jackson County Silvery.....	16.50 @	17.00
Other Ohio Silvery.....	15.00 @	15.50

Bars.—Better reports are received not only from the local companies, but also from representatives of outside mills; good orders have been placed within the past week, and the demand for small lots is steadily growing. The price of Soft Steel Bars, however, seems to be approaching the price of Iron again, and this is causing consumers to exhibit a preference for Steel when the difference is so slight. Among the sales made last week was one of 200 tons of Refined Iron at the equivalent of 1.55¢ Chicago. Quotations on Common Bar Iron now range from 1.45¢, half extras, Chicago delivery, and manufacturers claim that a good specification is required to secure the inside rate. Soft Steel Bars are selling at 1.47½¢ @ 1.55¢, Chicago. Jobbers continue to be in receipt of good orders from implement manufacturers and also from the smaller class of wagon builders outside of the city. The local wagon makers are buying but little at present, and the prospects in that direction for much business in the near future are not bright. Quotations from stock continue at 1.60¢ @ 1.70¢ on Bar Iron and 1.65¢ @ 1.70¢ for Soft Steel.

Structural Material.—More business is in sight in this line than for some time. The Honore Building is a large office building which will shortly be under construction, and will require a great deal of material in the shape of Beams and Columns. It will go to Pittsburgh, however, if the contract has not already been closed. Other business comprises an addition to the Minneapolis City Hall and new viaduct for Milwaukee. The latter will require some 3000 tons of Plates, Angles and other Shapes. A contract for 1000 tons of small Steel Nails was secured last week by a local mill. Quotations are maintained at the following prices on mill shipments, Chicago delivery: Beams, 1.75¢ @ 1.90¢; Tees, 1.95¢ @ 2.05¢; Angles and Universal Plates, 1.75¢ @ 1.80¢.

Plates.—More inquiry is reported in this line, and the prospects for business are much better than they have been. The Bridge works are doing more and are asking prices on good sized lots. The railroads at last are taking more material: also an inquiry in the market for at least 500 tons of Plates for the Pacific Coast. Store trade is not active, as the Boiler shops in this vicinity are doing but little. Prices are lower, as manufacturers are competing vigorously for the orders in sight. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.62½¢ @ 1.70¢; Shell Steel, 1.82½¢ @ 1.90¢; Flange Steel, 2.2½¢ @ 2.10¢; Fire Box, 2.75¢ @ 5¢. Store prices now prevail as follows: Iron or Steel Sheets, Nos. 10 to 14, 2.25¢ @ 2.40¢; Tank Steel, 2.10¢ @ 2.20¢; Shell Steel, 2.20¢ @ 2.40¢; Flange Steel, 2.50¢ @ 2.65¢; Boiler Tubes, 70 and 5% off.

Sheets.—The inquiry for Black Sheets is lighter and some makers are evidently more hungry for business and quote lower prices. The general quotation on mill shipments is 2.75¢, Chicago, for No. 27 Common, but this is shaded by one or two sellers. Small lots from stock are quoted at 3¢. Galvanized Iron is in fair demand and some agents are obliged to buy stock from other houses in order to meet the demand from their consumers. Prices on mill shipments appear to be a little firmer, but quotations on Juniata are continued at 75% off. Copper Sheets are quoted at 35% off.

Merchant Steel.—Scattering orders from manufacturing consumers are still being received by mill agents here, which have run to a good aggregate for the week. Consumers are specifying a little better. One large concern reports shipments for October greatly in excess of those for September, showing that business with that house has picked up considerably. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery, Tire and Open Hearth Spring Steel at 1.90¢ @ 2¢; Ordinary Bessemer Machinery, 1.60¢ @ 1.65¢; Ordinary Bessemer Tire, 1.55¢ @ 1.60¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

Steel Billets.—Sales of round lots of 4 x 4 inch Steel Billets are reported at \$19.50 @ \$20, Joliet. More inquiries are coming up and it looks as if the Joliet mill would be able to make a fair run, although it will not be pressed to its full capacity.

Rails and Track Supplies.—The only demand for Steel Rails at present seems to come from the Frog and Switch manufacturers. Railroads are buying no Rails to speak of. Some Light

Rails are being sold to mills and logging roads. Standard sizes continue to be quoted at \$30 @ \$32; Light Rails to 30 lb, \$31.50 @ \$32; 12 lb and upward, \$34.50; Iron and Steel Splice Bars, 1.50¢ @ 1.55¢; Track Bolts with Hexagon Nuts, 2.55¢ @ 2.60¢; Spikes, 1.85¢ @ 1.90¢.

Old Rails and Car Wheels.—Sales have been made of Old Iron Rails at a shade under the equivalent of \$14, Chicago. The railroads have in several instances receded from their former asking price, which was above the market, and are now more willing to meet the views of consumers. A sale of Old Steel Rails, mixed lengths, is reported at \$3.35. Long lengths are quoted at \$10 @ \$10.50. Old Car Wheels are moving to some extent, but the demand seems to be purely speculative, and consumers are buying very little. The speculative lots are taken in when the price made is in the vicinity of \$11. Carload lots command anywhere from \$13 to \$14.

Scrap.—Old Material is in better demand from all classes of consumers. The cheapest kind of material, such as Borings, Turnings, &c., is probably moving most freely. Some low sales have been made by holders desirous of realizing. No. 1 Forge has been sold in this way down to \$9, while Fish Plates have been sold at a shade under \$12. Dealers' selling prices, net ton, are as follows: No. 1 Forge, \$10; No. 1 Mill, \$8; Sheet Iron, \$4.50; Pipes and Flues, \$8; Axles, \$16; Horseshoes, \$11; Fish Plates, \$12; Spikes and Bolts, \$10; Cast Borings, \$4.50; Wrought Turnings, \$6.50; Axle Turnings, \$8; Heavy Cast, \$9.50; Stove Plate, \$7.75; Malleable Cast, \$8; Mixed Steel, \$7, gross ton; Leaf Steel, \$14.50.

Metals.—Carload lots of Lake Copper continue to be quoted at 10½¢ and casting brands 9½¢. Quite a sale of Old Copper was made during the past week for export to Germany. An improvement is noted in the demand for Spelter, which is now quoted at 3.50¢. Lead is a shade weaker and prices are not firm at the nominal quotation of 3.30¢ for large lots and 3.35¢ for car-loads.

The statement that 2000 tons of Southern Gray Forge had been sold at \$10 per ton, delivered at Cleveland, which was embodied in this report two weeks since, was made on excellent authority. The company reputed to have made the sale, however, deny it emphatically. In a telegram to their agents here, dated the 1st inst., they say: "Deny authoritatively reported Cleveland sales. No foundation whatever in fact." On the 2d they telegraphed again, in reply to an inquiry, "Are short Gray Forge. Do not wish to sell."

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts.,
CINCINNATI, November 8, 1893.

There has been little if any improvement in any feature of the Pig Iron trade during the week. There is, it is true, more confidence in the financial situation, but as yet this has not enlarged the demand for Pig Iron in this district to any large extent. There is rather more inquiry for Gray Forge, but the extent of it is greatly exaggerated, while for Foundry Iron the demand is very light and for Car Wheel

Iron there is no demand at all. All demands have so far been freely met at previous prices and there are offerings at the same rates to the end of this year, which is as far as the furnaces are disposed to name prices, but it is not improbable that they would accept orders running two months into next year for foundry grades. There have been some sales of No. 1 Soft at other points, and it is hoped that the more hopeful financial situation will lead to more trade in the future. The Iron Pipe works here are working on old orders, but are not receiving any important new orders. One hopeful feature in the trade is that shipments of Pig Iron have in many instances been resumed on old contracts. Quotations are as follows:

Foundry.

Southern Coke, No. 1	.....	\$12.75 @ \$13.00
Southern Coke No. 2	.....	10.75 @ 11.00
Southern Coke No. 3	.....	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	.....	14.50 @ 14.75
Lake Superior Coke No. 1	.....	15.00 @ 15.25
Lake Superior Coke No. 2	.....	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	.....	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	.....	17.50 @ 18.00
Tennessee Charcoal, No. 1	.....	14.00 @ 14.25
Tennessee Charcoal, No. 2	.....	13.00 @ 13.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	..... 17.00 @ 17.25

Forge.

Gray Forge	..... 9.75 @ 10.00
Mottled Coke	..... 9.50 @ 9.75

St. Louis.

(By Telegraph.)

Office of *The Iron Age*,
Bank of Commerce Building, }
St. Louis, November 8, 1893. }

Pig Iron.—The conditions prevailing in our last report are unchanged. Sales are limited to carload quantities and prices are unchanged, although shaded in some extreme cases. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	.....	\$13.00 @ \$13.25
Southern Coke, No. 2 Foundry	.....	11.25 @ 11.50
Southern Coke, No. 3 Foundry	.....	10.50 @ 10.75
Southern Gray Forge	.....	10.25 @ 11.50
Southern Car Wheel	.....	17.25 @ 18.25
Lake Superior Car Wheel	.....	16.50 @ 17.00
Ohio Softens	.....	16.00 @ 16.50

Bar Iron.—Jobbers report a steady trade at 1.75¢ for small lots from store. Mills quote 1.45¢, half extras, f.o.b. cars East St. Louis.

Barb Wire.—The demand continues to improve, and the cut in freight rates to Texas points has increased business from this point very materially. Mills quote Painted at \$2 and Galvanized at \$2.35. Jobbers ask \$2.10 for Painted with the usual advance for Galvanized.

Wire Nails.—The weakening tendency noted in our last report continues to be the feature of this department. Mills quote \$1.35 for carload lots to jobbers, and in some cases \$1.30 is named. Jobbers ask \$1.45 @ \$1.55, according to quantity.

Rails and Track Supplies.—The improvement noted in the demand for Track Supplies in our last report continues, with prices practically unchanged. We quote as follows: Splice Bars, 1.65¢ @ 1.70¢; Spikes, 2¢ @ 2.05¢; Bolts, Square Nuts, 2.50¢; with Hexagon Nuts, 2.60¢. Steel Rails are inactive at \$30 @ \$31. Old Rails are nominally quoted at \$14 @ \$14.50.

Pig Lead.—The movement in Pig Lead is restricted to small lots, which are generally quoted at \$3.15 @ \$3.20.

Spelter.—This metal is unchanged at \$3.30.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa. November 7, 1893.

There is little or no change to report, the demand for Iron and Steel being of the same languid character as for several weeks past. Some people claim to see an improvement in the number and character of the inquiries, but, judging from actual sales, there is no confirmation of anything of that kind. Wear and tear is beginning to tell, however, and small orders are somewhat numerous, but the aggregate increase—if there is any—is hardly perceptible. Prices remain at the lowest, and notwithstanding the talk of firm and somewhat higher figures in the West, there is no difficulty in placing orders at as low rates as have been named at any time since the summer months.

Pig Iron.—The demand is a trifle better for some grades and larger lots have been taken, but prices are as low as ever and give no promise of early improvement. It is not the large supply that affects prices, but the extremely light demand, which is probably not more than 35% to 40% of what is usually expected at this season. The cutting down in production must eventually bring about an adjustment; but, compared with the demand, the current supply appears to be as large as at any time within the past two or three years. The advance in freights will probably affect prices at some points, and in fact may involve a readjustment all the way through; but at the moment there is plenty of Iron at the lowest of all the low prices heretofore quoted, which for Philadelphia and equivalent points are about as follows:

No. 1 Foundry \$13.75 @ \$14.25
No. 2 Foundry 13.00 @ 13.25
Standard Gray Forge 12.00 @ 12.50
Ordinary Gray Forge 11.50 @ 11.75

At interior points, such as York, Harrisburg, &c., about 25¢ less is quoted on Virginia Irons.

Steel Rails.—The market is very dull, with prices weak and drooping. Sales are said to have been made at \$25.

Steel Billets.—There is no great demand, but sellers in this market are quoting pretty firm prices—say \$20 @ \$20.50, delivered. A few small lots have been taken, but there is no demand for anything large, although it is supposed that \$19.80, or pretty close to it, could be done on 1000 ton lots for good deliveries and quick settlements. Consumption is comparatively very small, hence the indisposition to bid on large lots.

Finished Material.—The demand shows no improvement, and the most that mills are able to do is to make one week keep up with another. Small orders are fairly numerous, but in the absence of a demand for large lots it is pretty close work to keep more than a few days' work on the books. Some deliveries are still being made on last spring's engagements, and a few good sized orders are in prospect, but after making the best show possible it is quite clear that as yet there is nothing that can be construed as an improvement either in price or demand. Nominal quotations are about as follows, but on large lots considerable reduc-

tions are made, varying according to circumstances:

Grooved Skelp, delivered.	1.47½¢	@	1.50¢
Best Refined Bars	1.52½¢	@	1.55¢
At interior points	1.40¢	@	1.50¢
Tank Steel	1.60¢	@	1.65¢
Heavy Plates	1.65¢	@	1.70¢
Shell	1.75¢	@	1.85¢
Flange	2.00¢	@	2.20¢

Old Material.—The demand is extremely light, and low as prices are, they seem to have very little attraction to consumers. Nominal prices are about as follows, but it is impossible to give exact figures, as a great deal depends on quantity, terms of settlement, &c.:

No. 1 Wrought Scrap, delivered.	\$12.00	@	\$13.00
Machinery Cast, delivered	10.00	@	11.00
Heavy Steel Scrap, delivered	12.00	@	13.00
Old Iron Rails, delivered	14.00	@	14.50
Old Street Rails, delivered	15.50	@	16.00
Wrought Turnings, delivered	10.00	@	11.00
Cast Borings, delivered	6.00	@	7.00
No. 2 Light Scrap	6.00	@	7.00

Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, November 7, 1893.

The general situation in the Iron and Steel trades shows continued improvement as far as demand is concerned, and the prospects of most of the mills getting enough work to run to nearly full capacity the balance of the year are very encouraging. Since our report of last week a number of concerns have started up to half capacity or more, some of them having done practically nothing for some months. This is particularly true of the Mahoning Valley, several of the mills there having put their finishing departments on this week after an idleness of more than four months. In the Pittsburgh district all the mills are doing something with one or two exceptions. Some of them are employed to full capacity, while the others are running to only one-half or less. At one plant in this city that finishes about 800 tons of material every 24 hours, all departments are on double turn, and have been since September, with good prospects of this being continued right along. Of course, the demand for Iron and Steel must increase to considerable extent yet before we can expect prices to be favorably affected. However, it would seem that on some lines bottom has about been reached, and any change to come must be in the nature of an advance. Bessemer Pig and Billets have held their own for the past week or ten days, and \$11.25 for the former and \$17.50 for the latter are being maintained.

Rumors of offers to sell Rails at prices equal to about \$22, Pittsburgh, have been current here for the past few days, but have been denied in certain quarters.

Pig Iron.—The increased activity among mills that have been in operation right along, together with the demand for Iron that will come from those that have started up within the past week or ten days, has resulted in more inquiries for Iron, and more sales were closed during the past week than in any one week for some time past. The expected increase in demand has resulted in the starting up of a number of furnaces that have been closed for extended periods. In the Shenango Valley, Sharon of the Sharon Iron Company, Limited, Douglass, under the management of Corrigan, Ives & Co.,

and Stewart of the Stewart Iron Company, Limited, have all gone in since November 1. Rosena of the Oliver Iron & Steel Company will start in a few days. In the Ohio Valley, Bellaire of the Bellaire Nail Works and one stack of the Riverside Iron Works have also started. In the Pittsburgh district two more Edgar Thomson stacks have gone in, and the last idle stack will be blowing in a few days. While it is somewhat doubtful as to whether it is the best policy to increase production to such an extent just now, at the same time it shows that there is considerable confidence in the future. Inquiries are more plentiful for Gray Forge now, and the market is firm on the basis of \$10.50, Pittsburgh. We quote as follows:

Neutral Gray Forge	\$10.50	@	\$10.75	cash
All-Ore Mill	10.75	@	11.00	"
Bessemer Pig	11.25	@	11.50	"
No. 1 Foundry	12.50	@	13.00	"
No. 2 Foundry	11.50	@	12.00	"

We note three sales of Bessemer, one of 1500 tons and two of 1000 tons each, all for November and December delivery, on the basis of \$11.25, Pittsburgh. Also a sale of 1000 tons of Gray Forge for November and December delivery at \$10.50, Pittsburgh.

Billets.—The improvement in inquiries for Steel as noted in our report of last week continues, and considerable tonnage has changed hands in the last week. While prices have shown no actual advance the tone of the market is better, and makers are refusing to accept orders that are offered them at prices which, perhaps, two weeks ago, would have been accepted. The increased activity among the mills in the Pittsburgh and the Mahoning Valley districts is, of course, responsible for the better demand for Steel, and in addition to this, the feeling is becoming more general that Billets are as cheap as they will get. All of the Pittsburgh mills are fairly well supplied with orders and the same is true of the Wheeling mills. The market is fairly represented by the quotation of \$17.50 @ \$17.75 at maker's mill. We note a sale of 1000 tons for November and December delivery at \$17.70 at maker's mill and one of 1500 tons at \$17.60 at maker's mill for same delivery.

Ferromanganese.—We are advised of a sale of 100 tons for November and December at \$53, delivered, equal to \$52.50 at maker's mill. This is the lowest price ever touched in this market.

Muck Bars.—The withdrawal from this market of two outside makes of Muck Bars has given a firmer tendency to prices for best grades of city made Bars and we quote them at \$21 @ \$21.25, delivered at buyer's mill. We note a sale of 1000 tons equal deliveries November and December at \$21, delivered, and one of 750 tons at \$21.25, same deliveries. An Ohio Valley concern have just closed a contract for 1000 tons of Muck Bars and started up their puddling department on Monday, November 6.

Rails.—It now is openly admitted that the combination price of \$29 is being cut right along. It is said that offers have been made to sell at prices equal to about \$22 at maker's mill.

Plates.—Business continues very light, with prices ruling about as follows: Tank, 1.40¢ @ 1.45¢; Shell, 1.60¢ @ 1.75¢; Flange, 1.65¢ @ 1.75¢; Fire Box, medium quality, 2.50¢ 3¢; best quality, 3 50¢ @ 4¢.

Structural Material.—There is a moderate demand confined altogether to small lots. No large orders are looked for now, as the close of the building season is at hand. Prices continue to depend nearly altogether on character of order and terms of payment. For ordinary business the following prices rule: Beams up to 15 inches, 1.50¢ @ 1.60¢; Angles and Universal Plates, 1.60¢ @ 1.65¢; Tees, 1.75¢.

Bars.—There is increased activity among the mills, the volume of business showing steady gains. As announced elsewhere, the Valley mills have arranged a wage scale with the National Union of Finishers, and the finishing departments of several plants were started this week. Prices continue very low, with no prospects of improvement until the demand gets heavier. We quote Steel Bars at 1.30¢ @ 1.35¢, with Bar Iron extras. In the Valley Iron Bars are held at 1.30¢ @ 1.35¢, half extras.

Wire Rods.—There is a fair demand, some of the mills having about enough business to keep them in full operation the balance of this year. The output of Rods during the month of October at the plant of the Pittsburgh Wire Company was the heaviest of any one month in the history of the concern. Prices depend largely upon the size of the order and terms of delivery. We quote at \$25.50 @ \$25.75 for early delivery. For a good sized order, with favorable terms of payment, our lower quotation would probably be slightly shaded.

Wire Nails.—The demand is fairly active, but prices show no improvement—in fact, have shown a weaker tendency during the past week. The bulk of the orders for trade in the Northwest have been filled, in the expectation that navigation would close about November 1, and for this reason the mills are in much better shape to take care of business being offered by the regular trade. We quote \$1.25 in carload lots at mill. For large orders this price has been slightly shaded. There is a moderate volume of business in Cut Nails, but, in sympathy with Wire Nails, prices have shown a weaker tendency. The market is represented by the quotation of \$1 at mill with the usual averages. For desirable orders this price has been shaded.

Barb Wire.—The demand is very light, there being practically nothing doing. Prices are weak and irregular, and we quote Four-Point Galvanized at \$2.20 in carload lots at mill, with the usual advances for less quantities. The above price would be shaded for a good order placed at this time. Painted is ruling at \$1.80 in carload lots. There is a fair demand for Plain Wire and we quote at \$1.55 @ \$1.60 for Nos. 6 to 9 in carload lots.

Pipes and Tubes.—A meeting of the Wrought Iron Pipe and Tube Manufacturers' Association was held in this city last week. No action of importance was taken, the unsatisfactory condition of the market being the principal topic under discussion. The demand for Pipes and Tubes is extremely light, and prices are low, with no prospect of improvement until the demand has materially increased. None of the mills are being operated full time, while a few plants are entirely closed.

Connellsville Coke.—For the week ending Saturday, October 28, there were 5752 ovens in the Connellsville region in blast, and 11,758 idle, with a total estimated production for the week

of 52,585 tons. There was a net gain of active ovens during the above week of 398. The increased activity among blast furnaces is expected to lead to an improved demand for Furnace Coke before long, and it is not believed that Coke makers will agree to make contracts for delivery for the first six months of next year at prices ruling now. We continue to quote Furnace Coke at \$1.10 in tons of 2000 lb, f.o.b. cars in Connellsville region. The price of Foundry Coke is being firmly maintained on the basis of \$1.50 to dealers and \$1.65 to consumers.

On November 1 George Eaton Collins was admitted to partnership in the metal brokerage business heretofore conducted under the name of H. E. Collins & Co., which has been changed to H. E. Collins & Son. The offices of the new concern are located on the third floor of the Bank of Commerce Building, Pittsburgh.

Louisville.

LOUISVILLE, KY., November 6, 1893.

Sales of No. 2 Foundry for delivery during three months have been made at basis of \$7.90 at furnace; the transaction was for cash without privilege of giving paper. All sales made recently for delivery running into next year have been on a basis of \$8 at furnace for No. 2 Foundry, though furnaces had insisted upon getting 25¢ a ton more, but the competition was such that when the transactions came to be closed almost all were willing to sell at this price. No. 1 Foundry for delivery during six months was sold on a basis of \$9, furnace, or a shade less, this being the lowest transaction for this grade made. Buyers in general feel that the market has reached bottom and that it is safe to purchase, and that the experience of finding later on that they could buy for less money than in the past is certainly at an end. We expect to see some confidence in buying from now on. The trade consider that present prices will rule for some time, with 25¢ advance being asked and paid for deliveries running for six months of next year. Car shops are shut down, with no immediate prospect of running. We quote for cash, f.o.b. cars Louisville:

Southern Coke, No. 1 Foundry, \$12.50 @ \$13.00
 Southern Coke, No. 2 Foundry, 11.25 @ 11.75
 Southern Coke, No. 3 Foundry, 10.75 @ 11.00
 Southern Charcoal, No. 1 Foundry, 15.00 @ 16.00
 Southern Car Wheel, 17.50 @ 17.75
 Spathite, 12.00 @ 12.50

New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, November 8, 1893.

Pig Iron.—There has been no increase in the demand for Pig Iron in this and tributary markets. We quote: Northern brands \$14 @ \$15 for No. 1; \$13 @ \$14.25 for No. 2; \$12.25 @ \$12.50 for Gray Forge, at tidewater. Southern Iron, same delivery, \$13 @ \$14 for No. 1; \$12 @ \$13 for No. 2; \$11.50 @ \$12.25 for No. 3; \$11.75 @ \$12.25 for No. 2 Soft, and \$12.25 @ \$12.50 for No. 1 Soft. Gray Forge is \$11.25 @ \$12.

Spiegeleisen and Ferromanganese.—Western reports indicate such low prices for domestic Ferromanganese that it must now be able to penetrate far Eastward. We quote: Foreign Spiegeleisen, nominally, for 10% @ 12%, \$21.50 @ \$22, and 20%, \$25.50 @ \$26,

on cars, Jersey City, and Ferromanganese, \$55.50 @ \$56.

Billets and Rods.—No new business of any consequence is reported. We quote nominally: Domestic Billets, \$20.25 @ \$22.50, and foreign Billets, \$28 @ \$28.50, tidewater; domestic Wire Rods, \$28.25 @ \$29, and foreign Rods, \$39.50 @ \$40, tidewater.

Steel Rails.—Prices on Steel Rails are now openly cut by the Rail mills and an eager canvass for orders is being made. The Pittsburgh mill is making great efforts to capture trade in the territory of the Eastern mills, but is being met by them. Some business has been done and more is pending. It is fair to quote \$24 @ \$25 at tidewater. There is a good deal of excitement and much uncertainty in the Rail trade. The sharp drop in the price is expected to bring out buyers as soon as they realize that values have gone down to the lowest point attainable. The fact that conservative and cautious buyers have already taken hold is proof of the fact that the heavy reduction has tempted them. It may be questioned whether even at the prices now openly quoted all the mills will continue to meet the market, and even those who do will probably be chary about taking too many orders.

Track Material.—Some business has been done at low prices: Small lots are selling at the following prices: Spikes, 1.80¢ @ 1.90¢; Fish Plates, 1.40¢ @ 1.60¢; Track Bolts, Square Nuts, 2.25¢ @ 2.40¢, and Hexagon Nuts, 2.40¢ @ 2.50¢, delivered. Concessions would be made for round lots.

Manufactured Iron and Steel.—There have been closed and there are pending for early settlement contracts for three large buildings in this city which will call for close upon 4000 tons of Structural Material. There are indications that work delayed earlier in the season is now being taken up. We quote nominally: Beams up to 15-inch, 1.70¢ @ 2¢; 20-inch, 2¢ @ 2.25¢, for round lots; Angles, 1.75¢ @ 1.90¢; Universal Mill Plates, 1.65¢ @ 1.90¢; Tees, 2¢ @ 2.15¢; Channels, 1.70¢ @ 2¢, on dock. Steel Plates are 1.60¢ @ 1.70¢ for Tank; 1.75¢ @ 1.90¢ for Shell; 2¢ @ 2.15¢ for Flange, and 2.50¢ @ 2.80¢ for Fire Box, on dock; Refined Bars are 1.50¢ @ 1.9¢, on dock, and Common, 1.40¢ @ 1.50¢; Soft Steel Bars are 1.50¢ @ 1.70¢; Scrap Axles are quotable at 1.70¢ @ 2¢, delivered; Steel Axles, 1.70¢ @ 1.90¢, and Links and Pins, 1.70¢ @ 1.80¢; Steel Hoops, 1.75¢ @ 1.90¢, delivered; Cotton Ties, 70¢ @ 72.5¢ \$45 lb bundle, at mill.

Old Material.—Old Iron Rails are nominally at \$13 @ \$14; Old Steel Rails, \$8 @ \$9, and Wrought Scrap \$9 @ \$11.

Stock Warrants.—The American Pig Iron Storage Warrant Company report as follows:

	Tons.
Stock in yard September 30, 1893...	77,700
Put in yard for 31 days ending October 31, 1893.....	1,700
Total.....	79,400
Withdrawn 31 days ending October 31, 1893.....	2,300
Net stock in yard October 31, 1893...	77,100

The firm of Cudlipp & Hollister, Pig Iron merchants, 15 Cortlandt street, have been dissolved by mutual consent. The obligations of the firm are being discharged as rapidly as possible. J. R. Cudlipp will continue a commission business in Pig Iron, Coke and Metals at the same address.

Markt & Co., Limited, agents for Eicken & Co.'s Tool Steel, have received a stock of that Steel, which, for want of room, is stored in the warehouse of Chas. E. Ring, near Roosevelt Ferry, Brooklyn. They quote No. 8 Steel, which is used for turning and finishing the hardest stock, at 30¢.

Financial.

No specially notable features have developed in the financial situation during the past week. The status of things in the money and stock markets has changed but little from that presented in our last report, and the general business condition of the country, although showing a distinctly better feeling in most quarters, has displayed as yet no remarkable revival of activity. The general interest felt in the elections in many parts of the country—and particularly in New York—may partially account for the tamelessness in speculation and industrial enterprise. This, however, is probably but the natural reactive effect after the strain of suspense and uncertainty had been removed by the passage of the Silver Purchase Repeal bill last week. To those optimists who looked for a marked and immediate revival of business and enterprise, the comparative dullness following on the heels of repeal must be a disappointment. But to those who took a more farsighted view of the effects of the Senate's action, the present condition is only a natural one. That action had been discounted by Wall street ten days before the event, and the extraordinary upward rush of values in the stock market which then took place was followed by a perfectly natural reflux of prices to a more reasonable level, the ebb tide having continued down to the present. Confidence, too, is a quality that is far slower in returning than people generally understand, and until its fuller restoration is effected no remarkable revival of activity can be expected.

The gradual restoration of monetary affairs to a normal condition is, however, surely taking place as an effect of the recent currency legislation. Business men see this, and unless the dread of another upset by radical tariff changes serves to repress enterprise and check trade to any serious extent this winter, a gradual, and therefore more permanent, revival of business on a sound basis is among the things confidently looked for. The bank reserves are larger than for years past, and these institutions, as well as trust and insurance corporations, are anxious to place their surplus funds at low rates of interest. This favorable condition is not likely to be long neglected by those requiring such accommodation. In any case it is conceded that the settlement of the much-vaed silver question, while it has not prevented a decline in prices, is destined to exert a favorable influence on the business interests of the country in the near future.

The final cancellation of the New York Clearing House loan certificates was followed on Saturday by the resumption of the weekly bank statement in detail for the first time for five months. It shows that a considerable number of the banks are carrying extraordinarily large reserves, some as high as 50% and 60%. The gain in surplus reserves during the week was \$3,225,975. The banks now hold \$52,000,000 above the legal requirement, as against \$2,700,000 at the same time a year ago and \$7,000,000 in 1891.

The most striking feature disclosed by the statement is, however, that the great accumulation of money is not, as was supposed, held by the banks that have been doing most of the country business, but by those that have the deposits of trust companies and similar institutions. The obvious inference from this fact is that hoarders have at last been constrained to bring out their funds and put them in deposit. The following table shows the bank changes as compared with last week:

	October 28.	November 4.	Differences.
Loans...	\$397,324,800	\$402,383,300	Inc. \$5,058,500
Specie...	96,561,500	97,116,500	Dec. 552,000
Legal tend...	60,538,400	66,750,100	Inc. 6,211,700
Net deposits...	433,261,700	447,412,600	Inc. 14,150,900
Circulation...	14,610,800	14,409,900	Dec. 200,900

No further orders for gold for import have been reported during the week, but exchange has been hovering around the importing point, and it is the general impression, both here and in Europe, that a resumption of gold imports to this country is imminent. In regard to this the London *Economist*, in a recent article, expressed itself as follows: "It is practically certain that considerable shipments of gold will have to be made to the United States, and it is the Bank of England's stock of the metal that will first be drawn upon. That is now fairly large, amounting to close upon £26,600,000, which is about £1,600,000 more than was held at this time last year, while the reserve is £1,900,000 greater than it then was."

The present situation of this country in respect of the gold movement is shown by the following figures:

Exports of gold from January 1, 1893, to date...	\$70,159,547
Imports for the same period.....	59,074,345
Net exports.....	\$11,085,152

On the Stock Exchange the market has been almost wholly a "traders'" one; the "bears" being usually in the ascendant, and succeeding in forcing down a number of the active stocks—particularly certain industrials—mainly below the prices of last week. Friday and Saturday showed dull trading with a declining tendency in prices; although the more favorable returns of St. Paul, Rock Island and other railroads promulgated at the end of the week strengthened the position of those issues, and at the close of the week they were firm and higher. Monday's dealings on the exchange were small, and the fluctuations relatively insignificant; except in the case of Sugar and Chicago Gas stocks, which yielded to determined bear attacks, closing at a decline of several points. The main business was, however, in clearing up prior to Tuesday, on which day the exchanges and other business institutions were closed. Altogether the week's market has been confined within purely professional limits, with very little public interest in evidence. The extreme fluctuations of some of the more active stocks during the week are shown in the following list, together with the closing prices on November 8:

	High- est.	Low- est.	Closing- est.	Nov. 8.
Am. Sugar Ref.....	102½	94½	100½	
Atchison, T. & S. F.	21½	19½	20	
Balt. & Ohio.....	75½	72	72	
Chicago Gas.....	68	58½	61½	
Chic., B. & Q.	83½	81½	82½	
Chic., Mil. & St. Paul....	66½	63½	65½	
Chic., Rock Isl. & Pac.	69½	66½	68	
Del. & Hudson.....	132½	129½	132½	
Del., Lack & Western....	175	171	173	
Gen. Electric.....	48	48½	45½	
Lake Shore.....	129½	126½	129	
Louisville & Nashville....	50½	47½	49½	
Manhattan.....	133½	130½	133½	

Missouri Pacific.....	27½	24½	25
Minnesota Iron, asked.....	50		
National Lead, Common.....	28½	26½	28
New Jersey Central.....	119	116½	119
New York Central.....	103½	102½	103½
N. Y., L. E. & Western.	14½	14½	14½
Northern Pacific, Pfd.	23½	21½	22
Philadelphia & Reading.	21½	19½	20½
Richmond & West Pt., Term.....	33½	31½	31½
St. Paul & Omaha.....	39½	37	38
Union Pacific.....	18½	17½	18
Western Union.....	90½	86½	88½

Government bonds have been strong and steady. The last sales on call were \$5000 4s, registered, at 112½; \$11,000 do. at 112½, and \$1000 4s, coupon, at 112½. The closing quotations were as follows:

	Bid.	Asked.
2s, 1891, registered.....	96	...
4s, registered.....	112	113
4s, coupon.....	112	113

Railway and miscellaneous bonds, while fairly active, have been irregular and weaker, there being a considerable contraction in the issues in which trading was done. Prices have also declined in most lines.

Money on call is offered in abundance at 1½% @ 2%, the offerings by private bankers being ample to meet the demand. The demand for time loans continues light, and the supply abundant, the market being free from discrimination as to the character of collateral accepted. The usual quotations for time loans are 3% @ 3½% for 60 and 90 days; 4% for four months, and 4% @ 5% for longer terms. Mercantile paper of good quality is being readily bought by both city and country banks, the rates being generally 5% for double name and 5½% @ 6% for single name.

The market for sterling exchange rules firmer, a rise of a fraction having taken place at the close of last week on a sudden demand for bills from importers. The advance was maintained early in this week, owing to a light supply of commercial bills and more demand against sales of securities for foreign account. Actual business was done at the close at \$4 81½ @ \$4 81½ for 60 days; \$4.84 @ \$4.84 for demand; \$4.84 for cables, and \$4.80 for commercial. Domestic exchange on New York is quoted as follows: New Orleans, commercial 200 discount, bank 31; Charleston, buying ½ discount, selling par; San Francisco, sight 12½, telegraph 17½ premium; Savannah, buying ½ discount, selling ½ discount @ par; Chicago, 75 @ 80 premium; St. Louis, 75 premium.

Silver is higher, the price for refined bars having advanced to 32½ pence per ounce in London, and 70½ p. ounce in New York. Some considerable shipments of silver have been made during the week, and the outlook promises a revival of trade in the metal instead of the reverse, as a sequel to the passing of repeal bill.

Metal Market.

Copper.—There have been additional purchases of fair sized lots of Lake Superior Ingots for prompt and near future delivery, chiefly by home consumers. At least 500,000 lb were involved. The prices ranged from 9½ up to 10¢, according to delivery and other contract specifications. Some improvement has been noted also in sales of other varieties that led stiff holding at 9½ @ 9½ for Electrolytic and 9½ @ 9½ for casting stock. Meanwhile export movement on old contracts has continued liberal, while the output from the mines is still under more or less restraint, making in all a condition of affairs that

serves to give the market greater tone of firmness for the time being at least. There is hardly any speculative interest, and legitimate trade movement seems to be the foundation of the turn for the better that has taken place since the beginning of the month.

Pig Tin.—The market has recovered slightly from the depression more or less conspicuous during the period covered by last week's review. Prompt and current month deliveries now command about 20.60¢ and the offering is somewhat reserved. Comparatively few speculative transactions have been reported and purchases by jobbers and consumers have not exceeded the average volume. Still the amount of stock in first hands continues to steadily diminish and the statistical position here is stronger to that extent. A partial offset exists in the fact that European stocks are being largely increased and that prices in the foreign markets are gradually receding to the parity of local market quotations. The visible supply in Europe and America is estimated at about 15,000 tons, or nearly the same as the quantity recorded for the corresponding period last year, including 3700 tons in America, exclusive of Pacific Coast, and 700 tons afloat.

Pig Lead.—Speculative interest in this metal has been on the wane, and consumers have purchased in a very indifferent manner. Sellers have not offered in a manner indicative of unusual pressure to secure orders, but the supply on offer seems to be in excess of the outlet and prices are correspondingly easier. Common domestic was freely offered at 3.35¢ in round lots toward the close of the week, while bids of over 3.30¢ for deliveries this month or next were exceedingly few. In fact, there were some sellers at the latter price.

Spelter.—Little if any change has taken place. The popular quotations are 3.60¢ @ 3.65¢ for ordinary Western brands, with about the usual premium for special or fancy brands. Business has been slow here, individual transactions involving more than single car-loads being the exception. The demand is exceedingly tame at this writing.

Tin Plates.—Fairly large orders have been placed for 100-lb. Bessemer Steel Cokes, March and April delivery, at about \$4.90, landed here. Otherwise the interest in futures continues tame. Spot business continues uneven, but importations are fairly well absorbed, and dealers secure about former prices for most varieties. Spot quotations are as follows: Coke Tins—Penlan grade, IC, 14 x 20, \$5.35; J. B. grade, do., \$5.40; Bessemer full weight, \$5.35 @ \$5.40; light weights, \$4.95 @ \$5 for 100 lb, \$4.85 for 95 lb, \$4.70 @ \$4.75 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60; Siemens Steel, IC basis, \$5.65; IX basis, \$6.75 @ \$7. Charcoals—Melyn grade, IC, \$6.37½ @ \$6.50; Crosses, \$8; Allaway grade, IC, \$5.60; Crosses, \$6.75; Grange grade, IC, \$5.75; Crosses, \$6.85. Charcoal Ternes—Worcester, 14 x 20, scarce; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.75; do., 20 x 28, \$15; Dean grade, 14 x 20, \$5.30 @ \$5.37½; do., 20 x 28, \$10.50 @ \$10.60; D. R. D. grade, 14 x 20, \$5.15; do., 20 x 28, \$10.10; Alyn, 14 x 20, \$5.32½ @ \$5.35; do., 20 x 28, \$10.40; Wasters—S. T. P. grade, 14 x 20, \$4.75; do., 20 x 28, \$9; Abercarne grade, 14 x 20, \$4.60; do., 20 x 28, \$8.87½.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]
LONDON, WEDNESDAY, November 8, 1893.

The market for Pig Tin has been dull, and prices have moved somewhat irregular, in sympathy with the fluctuations in silver. At a slight advance established there was free selling, under which prices dropped, since buying orders were on a very limited scale. Prompt delivery was sold at as low as £76. 10/, and futures at proportionate figures. At the close the market was soft, with £77. 10/ @ £77. 12/6 quoted for prompts, and £77. 5/ @ £77. 7/6 for futures.

Copper improved somewhat from the lowest point reached last week, with £42. 10/ reached for Merchant Bars for prompt delivery. Subsequently there was a reaction to £42. 3/9, despite the repeal of the Sherman Silver bill and more favorable reports from the American market. Realization of profits by speculators has held in check a better turn in prices. Purchases by consumers have been good. European stocks increased 286 tons last month and the visible supply shows a gain of 136 tons. Chili charters the last fortnight were about 1000 tons. Sales of furnace material latterly have been moderate. Among others were 200 tons Montana Matte at 9/.

The Tin Plate market is without decided change. Prices are steady. There is a very fair home trade demand, also some export inquiry for futures. The latter was chiefly for oil sizes at 11/, f.o.b. Swansea, but some sales were made of ordinary Cokes at relatively better price. Exports last month amounted to 27,000 tons, against 31,000 tons in October, 1892. Shipments to the United States were 13,000 and 19,000 tons respectively. Liverpool quotations were as follows:

IC Charcoal, Alloway grade.....12/6 @ 13/
IC Bessemer Steel, Coke finish.....11/6 @ 11/9
IC Siemens " " ".....11/9 @ 12/
IC Coke, B. V. grade, 14 x 20.....11/6 @ 11/9
Charcoal Ternes, Dean grade.....11/3 @ 11/8

Pig Lead has met with slow sale, but the market is firmer at £9. 15/ for Soft Spanish.

Spelter has been in only moderate request, but sellers are firmer and now asking £17 for ordinary Silesian.

All branches of the Iron and Steel market is dull and prices lean more or less in buyers' favor. Exports of Pig Iron last month were 89,000 tons, against 92,000 tons in October, 1892. Last dealings in warrants were at 42/4 for Scotch, 34/4½ for Cleveland, and 44/4½ for Hematite.

The Valley Scale Settlement.

Last week several conferences were held in Youngstown between a committee representing the National Union of Finishers and a number of the Valley mill owners, with the result that a wage scale governing the finishing departments of the Valley and other Western Ohio mills was agreed upon, and has been signed by the Mahoning Valley Iron Company, the Andrews Brothers Company and the Union Iron & Steel Company. The terms of this scale have not been made public, but it is announced that its provisions are mutually satisfactory to both employer and employee. Enough is known concerning it, however, to warrant the statement that it differs essentially from the scales heretofore made by the Amalgamated Association, and shows conclusively that the new labor organization referred to above has started out with the determination to

accord fair treatment to the manufacturers who will agree to recognize it. In the first place the scale is based on a 1½ cent card rate, while the Amalgamated Association scale is based on a 2-cent rate, having recently been changed back from a 1½ cent basis to a 2-cent basis. The wisdom and necessity of this change is at once apparent to those who have watched the steady decline in the selling price of iron and steel bars, until 1.35 cent at mill is the outside figure now attainable. While it is possible that the price of bars, owing to heavy demand or other unusual conditions, may advance to 1.50 cent, it is not thought that 2 cents will ever again be reached. The scale also calls for material reductions in wages, which were also necessary before the Valley mills could see their way clear to start up and compete with the non-union mills in the Pittsburgh district. But perhaps the most important change of all lies in the fact that the scale is a perpetual one, and is in force so long as notice is not given by either side of a desire to change it, and its provisions require that three months' notice must be given before the terms of the scale can be changed. This is a point that manufacturers in Pittsburgh and elsewhere have been striving for years to have the Amalgamated Association concede to them, but which has persistently been refused. It was the real cause of the disastrous Homestead strike in July, 1892, as the Amalgamated Association conceded everything asked by the Carnegie Steel Company, Limited, but refused to allow the scale to be a perpetual one, insisting that it must expire in June to conform with the time of expiration of other Amalgamated Association scales. Another important feature of the scale lies in the fact that every employee whose wages are fixed by it must attach his signature to it if desired by his employers. This virtually makes it a personal contract between the firm and each of its employees, and will reduce to a minimum the chances of a strike taking place should disagreements arise at any time. Other changes of a minor character have been made in the scale, some of which were suggested by the mill owners and others by the employees. The fact that the Valley mill owners accept and sign a scale largely prepared by representatives of the National Union of Finishers certainly speaks well for the business methods employed by that organization, and will aid it considerably in obtaining recognition from other manufacturers. As no puddlers belong to this organization the price to be paid for boiling is yet unsettled, but it is understood that the Valley mill owners have fixed \$4.50 per ton as the price they are willing to pay for this class of labor. If the puddlers belonging to the Amalgamated Association do not agree to accept this price, it is likely the puddling departments will remain idle, or else muck bars will be bought in the open market. By reason of the low cost of billets some concerns will use largely of these, and as a consequence the amount of puddling done in the Valley from now on will be somewhat less than in the past. The completion of the Bessemer plant of the Ohio Steel Company, in which some of the Valley mill owners are interested, will also result in an increased use of billets and a corresponding displacement of puddling. The acceptance of the scale of the National Union of Finishers will further weaken the Amalgamated Association and will undoubtedly hasten the final disruption of that once powerful labor organization.

HARDWARE.

Condition of Trade.

NOVEMBER opens with some indications of improvement, although the volume of business is not, on the whole, materially increased. A goodly number of small orders have been coming in to merchants' and manufacturers' representatives in this market, indicating something of a quickening in the demand and a disposition on the part of the trade, especially of the retail trade, to purchase a little more freely. The advance of the season, however, has its effect in restraining trade. As usual at this time of the year, there is more or less falling off in the volume of business. It is evident that stocks in the hands of retailers are unusually limited, the character of the orders showing that assortments are pretty well depleted. The policy which has been pursued for the past few months of limiting purchases to such goods as are absolutely required is still adhered to, and a very conservative spirit dominates the whole conduct of business. While the effect of this is to curtail trade for the present, it is unquestionable that this is the safest and wisest course, and tends to put business on a solid basis, averting serious disaster and laying the foundation for future prosperity.

Chicago.

(By Telegraph.)

No improvement is perceptible in the Shelf Hardware trade. Perhaps in a few departments there may be some little increase in the volume of business, but the aggregate shows a decline rather than an increase. If trade continues in this way during the month of November the volume of business will be considerably under that of October. The decline is not attributed so much to lack of demand, however, as to hesitation in extending credits. Jobbers state that opportunities are offered them to sell considerable quantities of goods to new customers or to parties whose financial standing is not of the best. The better class of merchants, whose credit is high, buy quite sparingly and are very conservative. The demand for Tin Plate and tinnings' stock is much better than it has been, but the improvement is not enough to make merchants feel elated over the change. It is simply a movement in the right direction, which they welcome. Job-

bers of Heavy Hardware are still in receipt of good business from consumers of Iron and Steel, like the Implement manufacturers, and also report a little better demand from out of town wagon builders. City trade is quiet.

St. Louis.

(By Telegraph.)

The backward weather has had a depressing effect on the demand for Hardware, especially so far as cold weather goods are concerned. The demand for shelf goods continues to keep improving, but yet fails to reach the corresponding period of last year. Retail dealers continue to buy sparingly and as a result their stocks are lower than ever before, and any improvement in the demand would compel them to enter the market as buyers. Firearms and Ammunition continue in good demand. Credits are still closely scrutinized, but there is a disposition to be more liberal in this direction. It is generally conceded that November and December will be quiet months, but a heavy increase is anticipated after the turn of the year.

Notes on Prices.

Wire Nails.—The Wire Nail market continues in substantially the same condition as last week. It is represented by the quotation of \$1.20 to \$1.25 for carload lots at mill, the former figure being obtainable on good orders. There has been a fair demand and most of the mills are well occupied.

Chicago, by Telegraph.—Manufacturers of Wire Nails report business as keeping up about the same as it has been for the past week or two. They are quoting \$1.32½ here for factory lots, but this is now the price for ordinary lots to which the general market has settled. Small lots from stock have receded to \$1.45 on account of the lower prices from factory.

Cut Nails.—There is only a moderate inquiry for Cut Nails and the market does not show an increase of strength in price, quotations being on a basis of 95 cents to \$1 for carload lots at mill. Concessions are made in special cases. The New York price for small lots from store is \$1.20 to \$1.25.

Chicago by Telegraph.—A better inquiry and more sales than the previous week is the report received from manufacturers of Cut Steel Nails. Low freights to the Southwest are having an important influence on their business at present. Some quite large lots are under negotiation. Prices are still quoted at \$1.20 to \$1.25, Chicago, for

factory lots, while small lots from stock are unchanged at \$1.30.

Barb Wire.—There are indications of a slight increase in the volume of business in Barb Wire, but trade is on the whole sluggish and unsatisfactory. Quotations continue on the basis of \$2.15 for carload lots of Four-Point Galvanized at mill, but this price has been shaded. Manufacturers are solicitous to obtain orders and as a result quotations are somewhat uneven.

Chicago, by Telegraph.—The Barb Wire trade has picked up to some extent, although the demand is considerably less than manufacturers would like to experience at this time of the year. A better outlook is now offered for trade with the Southwest, owing to the low freight rates. This is having its effect on trade, as it comes in addition to the better impulse in the West and Northwest. Prices continue as before on a basis of \$2.40, Chicago, for Galvanized in carload lots, and \$2.55 for small lots from stock. The demand for Plain Wire has increased rapidly within the past two weeks. Manufacturing establishments consuming Wire have started up quite generally, and some of them are running to their usual capacity in ordinary times. The manufacturers of Mattresses are particularly prominent in this better condition of business, but the implement makers and others who consume Wire to considerable extent are also more inclined to buy than for several months, and are placing good contracts with the manufacturers.

Powder.—**LAFLIN & RAND POWDER COMPANY**, 29 Murray street, New York, issue under date November 1 revised prices for Gunpowder, which are subject to a discount of 2 per cent. for cash in ten days:

	In Kegs. Pounds.	
Orange Rifle, extra.....	25	\$3.25
" " "	12½	1.90
" " "	6½	1.10
Orange Special.....	25	4.25
" "	12½	2.40
" "	6½	1.35
Creedmoor.....	6½	1.10
Orange Ducking (Gold Band).....	6½	2.25
Blasting and Mining (B).....	25	1.50
" " (A)....	25	2.00

Canister Powder.

	In Canisters. Pounds.	
Orange Lighting	1	\$0.75
Orange Ducking.....	1	.45
Orange Rifle, extra.....	1	.25
" "	½	.15
" "	¼	.12

It will be observed that the above list shows a reduction in price of Rifle Powder in canisters and of Lightning and Ducking Powder. On Rifle and all Sporting Powder in lots of 1000

pounds or over, one sale, one shipment and to one consignee, a discount of 10 per cent. will be allowed. In less quantity there is no discount. The prices of Blasting and Mining Powder as quoted are net.

THE HAZARD POWDER COMPANY, 63 Pine street, New York, under date November 1, in issuing their revised price-list refer to the fact that it shows a large reduction in all the Sporting Powders, especially in the finer grades—namely, Electric and Duck Shooting—and also in canisters of Kentucky and Indian Rifle, to which they direct particular attention, and express the hope that this reduction will lead to increased consumption of the higher class of Powders. Their revised list is as follows, which on Rifle and Sporting Powder in lots of 1000 pounds and over, one sale, one shipment and to one consignee, is subject to a discount of 10 per cent., and on all bills paid within ten days a discount of 2 per cent. will be allowed:

Canister Powder.

	Pounds.	Each.
Electric, Nos. 1, 2, 3, 4, 5, 6 and 7 grain, square canisters of.....	1	\$0.75
Duck Shooting, Nos. 1, 2, 3, 4, 5 and 6 grain, in oval canisters of.....	1	.45
Duck Shooting, Nos. 1, 2, 3, 4, 5 and 6 grain, in oval canisters of.....	½	.30
Kentucky Rifle, FFFg, FFg and Sea Shooting Fg, in oval canisters of.....	1	.25
Kentucky Rifle, FFFg, FFg and Sea Shooting Fg, in oval canisters of.....	½	.15
Kentucky Rifle, FFFg, FFg and Sea Shooting Fg, in oval canisters of.....	¼	.12

Keg Powder.

	In kgs.	Pounds.
Duck Shooting, Nos. 1, 2, 3, 4, 5 and 6 grain.....	25	\$8.00
Duck Shooting, Nos. 1, 2, 3, 4, 5 and 6 grain.....	12½	4.25
Duck Shooting, Nos. 1, 2, 3, 4, 5 and 6 grain.....	6½	2.25
Kentucky Rifle, FFFg, FFg and Sea Shooting Fg.....	25	3.25
Kentucky Rifle, coarser grains FG Duck Size and FG Duck Size No 1.....	25	3.25
Kentucky Rifle, coarser grains FG Duck Size and FG Duck Size No 1.....	12½	1.90
Kentucky Rifle, coarser grains FG Duck Size and FG Duck Size No 1.....	6½	1.10
Trap Powder, Nos. 1, 2 and 3, for club shooting.....	25	4.25
Trap Powder, Nos. 1, 2 and 3, for club shooting.....	12½	2.40
Trap Powder, Nos. 1, 2 and 3, for club shooting.....	6½	1.35
Meal Powder.....	25	4.00
Shipping Powder, F, FF, FFF, FFFF and CCC.....	25	2.00
Mining and Blasting Powder (A.) C, F, FF, FFFF, FFFF, in kgs.....	25	2.00
Mining and Blasting Powder (B.) C, F, FF, FFFF, FFFF, in kgs.....	25	1.50

The company state that for any quantity less than 1,000 pounds of Rifle and Sporting Powder no discount is allowed, and that Blasting and Shipping Powder are net.

E. I. DU PONT DE NEMOURS & Co., Wilmington, Del., and 32 Pine street, New York, issue November 1 the following revised quotations, which show a general reduction in prices. Rifle and Sporting Powder in lots of 1000 pounds and over, one sale, one delivery and to one consignee, are subject to a discount of 10 per cent., any less quan-

tity being net, terms f.o.b. New York, subject to a discount of 2 per cent. for cash in ten days:

Canister Powder.

	Pounds.	Each.
Crystal Grain, Nos. 1, 2, 3 and 4, in canisters of.....	1	\$0.75
Eagle Duck Shooting, Nos. 1, 2 and 3, in canisters of.....	1	.45
Eagle Duck Shooting, Nos. 1, 2 and 3, in canisters of.....	½	.30
Eagle Rifle and Superfine Sporting, in canisters of.....	1	.45
Du Pont Rifle, Fg, FFg and FFFg, in canisters of.....	1	.25
Du Pont Rifle, Fg, FFg and FFFg, in canisters of.....	½	.15
Du Pont Rifle, Fg, FFg and FFFg, in canisters of.....	¼	.12

Keg Powder.

	Pounds.	Each.
Eagle Duck Shooting, Nos. 1, 2 and 3, in kegs.....	25	\$8.00
Eagle Duck Shooting, Nos. 1, 2 and 3, in kegs.....	12½	4.25
Eagle Duck Shooting, Nos. 1, 2 and 3, in kegs.....	6½	2.25
Du Pont Rifle, FFFg and FFg and Sea Shooting Fg, in kegs.....	25	3.25
Du Pont Rifle, FFFg and FFg and Sea Shooting Fg, in kegs.....	12½	1.90
Du Pont Rifle, FFFg and FFg and Sea Shooting Fg, in kegs.....	6½	1.10
V. G. P. for Trap Shooting, in kegs.....	25	3.25
V. G. P. for Trap Shooting, in kegs.....	12½	1.90
V. G. P. for Trap Shooting, in kegs.....	6½	1.10
Choke Bore, Nos. 5 and 7, in kegs.....	25	4.25
Choke Bore, Nos. 5 and 7, in kegs.....	12½	2.40
Choke Bore, Nos. 5 and 7, in kegs.....	6½	1.35
Mealed Powder, in kegs.....	25	4.00
Shipping Powder, F, FF, FFF, FFFF and CCC, in kegs.....	25	2.00
Mining and Blasting Powder (A.) C, F, FF, FFFF, FFFF, in kegs.....	25	2.00
Mining and Blasting Powder (B.) C, F, FF, FFFF, FFFF, in kegs.....	25	1.50

Sheet Zinc.—Under date November 3, Matthiessen & Hegeler Zinc Company, La Salle, Ill., issue a revised price-list and discount sheet of Sheet Zinc, quoting the advanced price of \$4.50 per 100 pounds in 600-pound casks of the thicknesses between Nos. 9 and 15, inclusive, and of the widths between 32 and 46 inches and of the lengths between 84 and 90 inches. They also announce the following revised extras in cents per 100 pounds:

Extras in Cents per 100 Pounds.

	Nos.	5	6	7	8	9	10	11	12	13	14	15
32	x 84	75	45	30	10	.....	.....	.....	.....	.....	.....	.....
40	x 84	100	50	30	20	20	20	20	20	20	20	20
32	x 84	100	50	30	20	20	20	20	20	20	20	20
46	x 90	225	95	80	65	45	45	45	45	45	45	50
52	x 84	150	75	50	30	20	20	20	20	20	20	25
50	x 84	120	85	75	50	20	20	20	20	20	20	25
48	x 108	100	45	40	20	15	15	15	15	15	15	20
48	x 84	255	135	85	55	20	10	10	10	10	10	10
36	x 108	160	140	75	40	35	25	20	20	20	20	25
36	x 96	135	65	40	25	20	10	10	10	10	10	10
30	x 84	110	70	50	25	15	15	10	10	10	10	10
28	x 84	120	80	60	35	25	25	25	25	25	25	25
26	x 84	140	90	70	40	35	25	25	25	25	25	25
24	x 84	150	110	85	20	15	05	05	05	05	05	05

The extra on No. 4 36 x 84 is \$1.35 per hundred pounds.

The following are the charges for small lots:

In casks of 100 pounds (all Nos. up to and including No. 12), 30 cents extra per 100 pounds.

In boxes of 100 pounds (not larger than 30 x 40 inches), 30 cents extra per 100 pounds.

In 200 and 300 pound casks (all Nos. up to and including No. 14), 20 cents extra per 100 pounds.

In 200 and 300 pound boxes (not larger than 36 x 50 inches), 20 cents extra per 100 pounds.

The discounts announced are as follows:

Discounts.	First class. 1½ 600- pound casks and up- ward.	Second class. 10 to 14 600- pound casks.	Third class. 5 to 9 600- pound casks.	Fourth class. Under 5 600- pound casks.
	Per cent.	Per cent.	Per cent.	Per cent.
Special.....	0	0	0	0
Cash with or- der.....	3	3	3	3
Quantity.....	3	2	1	0
Total.....	6	5	4	3

It is stated that all discounts are computed straight when money accompanies the order and the quantity discount is added to the special discount in all cases. The prices thus announced are subject to change without notice.

Brace Bit Gauge.—The Wilks & Whitus Brace Bit Gauge, for which T. G. Ellsworth, 85 Chambers street, New York, is agent, is sold to the trade at \$9 per dozen net. An illustrated description of the Gauge appeared in *The Iron Age* September 28, 1893.

Glass.—There has been quite an increase in the number of Window Glass factories that have gone into operation since our last report, although the prices at which Glass is offered would not appear to offer much inducement for commencing work. While no official acceptance of the proposed wage scale has taken place, individual factories are making arrangements with their workmen. Single and Double Strength are offered at the same discounts, a Western jobbing house quoting 80 and 20 per cent. discount for either, in lots of ten boxes, f.o.b. cars. A quotation was made to a Southern point, from another source, at 85 per cent. discount on Single or Double, freight prepaid to destination. Imported Glass is still

quoted at 75 and 10 and 5 to 80 and 5 per cent. discount. Plate Glass factories are running just enough to supply the demand, which is light.

John Rothery.

JOHN ROTHERY, senior member of the File manufacturing firm of J. & W. Rothery, Matteawan, N. Y., died after a somewhat extended illness on Monday, October 16. A portrait of Mr. Rothery is given herewith.

John Rothery was of English parentage, but was born in Calais, France, on March 9, 1821. His father was a prominent File maker of Calais. Mr. Rothery's ancestors were a family of File makers, and for over 100 years the family have manufactured Files. Mr. Rothery's father came to America in 1827, and located at Paterson, N. J., where he was employed by Rogers, Grosvenor & Ketchum in recutting Files. In 1828 he removed to Matteawan, N. Y., where he took charge of a File factory. The first shops were erected on the banks of Fishkill Creek in 1835. In 1846 a third shop was built. In these shops Mr. Rothery founded the well-known reputation and character of American made Files, and introduced them to favorable notice in England. A short time after the third shop was built he erected a frame building, in which he prosecuted the manufacture of Files under his own name. This building was abandoned in 1852, and he then located upon the property on which the Rothery File Works now stand. He also ran a shop at Wicopee in 1851, which was in operation until 1870. He is said to have been the first man to use an emery wheel in this country for polishing machinery and Sad Irons. He is also said to have been the first to use flanges on the mammoth grindstones used in File making. He also gave much attention to astronomy, polished his own lenses and constructed a number of powerful telescopes. He was a man of intelligence and ability and possessed of unusual force of character.

Mr. Rothery's sons were all brought up as File makers, and when he died at Matteawan April 1, 1858, they continued the business. John, the subject of this sketch, who succeeded to the management of the business, inherited the positive traits of his English progenitors. His opinion once formed was very difficult to sway, and his convictions were expressed in a plain, outspoken manner. Of strict integrity and much intrinsic worth, his pledge once given was certain of redemption. Socially he was of a domestic and retiring disposition, and aside from the demands of his business his time was

spent at his home. He confined himself almost absolutely to the supervision of File making at the works, the successful marketing of the goods devolving entirely on his agents, Walsh & Coulter, later Walsh, Coulter & Flagler. Mr. Rothery was a man of extreme conservatism, and averse to the adoption of new methods in the manufacture or marketing of his goods, as illustrating which it is narrated that on one occasion when he was urged by his agents to make a trip in the West for the purpose of visiting the leading jobbing houses he peremptorily declined, intimating that if it was necessary for him to cross the Hudson River to sell his goods he preferred that they should remain unsold.

resigned before his term expired. He was also a member of the Board of Education of Matteawan eight or ten years ago. Mr. Rothery leaves a widow and five children, two sons and three daughters, William A., Frederick, Mrs. J. E. Selden, Mrs. William Whitham and Mrs. Charles Sperring, all of whom reside in Matteawan with the exception of Mrs. Sperring, who resides in Philadelphia. Two brothers and two sisters also survive him. Mr. Rothery owned a beautiful residence, which he had named "Robin Nest." The grounds are large and spacious and his home afforded him great delight and comfort.

Mr. Rothery's funeral was held on the 18th ult. During the passage of the funeral cortège the stores of Matteawan were closed as a tribute of respect to the memory of the deceased, whose death, as a man of high character and exceptional qualities, was lamented by all who knew him.

Mr. Rothery's place as a maker of Files was unique, inasmuch as he was a pioneer in their manufacture in this country, having done in connection with the house with which he was identified probably more than any one else to give American Files character and standing. His ambition was to make as good a File as possible, estimating quality of far greater importance than quantity, or even the profit derived from the business, and preferring to have a comparatively limited trade on old lines rather than incur the risks of experiment involved in the adoption of new methods. In this ambition he was successful, and took much well-deserved satisfaction in the high reputation in

which the Files of his firm have always been held. In the painstaking care in the production of goods which is shown throughout his career there is a lesson for manufacturers in other branches of the trade. A more enterprising and less conservative spirit might have resulted in the doing of a larger business, but it is pleasant to record the success achieved by him on the lines which he so consistently followed, the esteem in which he was held by all who knew him, and the unique and very honorable position which he held as a manufacturer of Files.

JOHN ROTHERY.

Thoroughly painstaking and honest. Mr. Rothery's ambition was to produce the best File possible. It is said of him by competent veteran Hardwaremen that he made and sustained a reputation for American made Files when they were utterly without standing, producing goods which for quality and workmanship stood the severest tests, and said to be fully equal to the best English makes. In later years he was unwilling even to test the quality of American as against English steel for the purpose of meeting domestic competition, in one case refusing to make up 5000 dozens of Files under a special brand at the expense and risk of those who marketed his entire production.

In 1863 Mr. Rothery was elected supervisor of the town of Fishkill, but

JOSEPH A. BOGARDUS, Hardware merchant, 167 Chambers street, New York, was the nominee of the Prohibition party for the office of Secretary of State for New York.



How to Extend One's Business.

BY FERDINAND TUSCH.

TO ADVERTISE, according to Webster, is to "inform or apprise," and among the many and best direct means under the immediate control of the dealer is to secure and preserve the reputation of a cleanly kept and well assorted stock in all salable lines. "All out; can't say just when I'll have more," suggests indifference or intended suspension and invites it. "One of a kind" always in sight, tastefully arranged, attracts and rivets attention, and is frequently alluring to the observer. Goods should be kept in such order that nothing need be looked for; it should always be there. When they are in fair demand, and are bulky or cumbersome, assorted samples should be kept in facile position for daylight inspection, and that all may be preserved in a cleanly condition the sample should be sold whenever possible, replacing such from the main stock. The value of racks for Farm and Garden Tools, Guns, &c., cannot be too strongly recommended, while plush or velvet lined showcases for Table Ware are indispensable for the exhibition of such to the best advantage.

WINDOWS AND STORE FRONTS.

Many Hardwaremen do not fully appreciate the value of their windows and store fronts as indexes of the store contents. "What's the use? every one knows me (or us) and what is kept in Hardware," is a common excuse for ill kept windows. This is a mistake. Windows tastefully arranged and frequently varied diffuse intelligence of many articles of shop or household applicability and may create demand. If there are several or more Hardware stores in town, the one which attracts the most attention, other things being equal, secures the most trade. If there be but one, the display of mechanics' tools, excepting novelties, need not be so prominent, as the purchasers of such have but one resort. The front should then be devoted to household novelties and articles of popular use.

SPECIAL LINES.

All dealers recognize seasons for special lines, and, as such approach, the exhibition of the articles should be slightly in advance of the actual needs, thus serving as a reminder to the consumer of renewals or replacements. When possible, the appliance ready for practical operation should be exhibited. In this class might be mentioned gas and oil Cooking Stoves, Clothes and Mop Wringers, Carpet Sweepers, filled Fruit Jars, &c. Such a method invites confidence and dissipates the uneasiness attending the purchase of "a pig in a bag." To explain the use of an article is a cold method in comparison with the demonstration of its merits, which frequently warms the languid inquirer into actual purchase.

NOVELTIES.

Because an article has never been sold in a town or never asked for is no reason why it should not be. To the drummer's solicitation in this direction should be added unprejudiced judgment, and the results may swell the general profits. Nor need a dealer await demand. He should seek to create it. Each issue of *The Iron Age* contains over 100 pages of advertising matter, and is a veritable compendium of reference, inasmuch as thousands of articles have their uses therein set forth.

IMPRINT OF THE BUSINESS.

If the town is so situated as to be visited by many from adjacent sections, some permanent signs can be erected at its rail and vehicle approaches, and made conspicuous by some symbol of trade, a few words, and prominence of name and locality. Such are impressed upon the minds of periodical visitors by the unvarying recurrence. Unaddressed circulars promiscuously distributed are of little benefit, though cards bearing a simple inscription with a bold and preferably an original design are preserved or circulated. All goods should be wrapped in strong paper bearing the imprint of the business, for such covering frequently circulates among many hands before its usefulness expires.

SIGNS, BULLETINS, ETC.

Signs from curb to store front, bulletins of Skates, Refrigerators, Sleighs, Freezers, Mowers, &c., all in their seasons should be displayed, and if the dealer uses a wagon modesty should not forbid him to paint his name and business in the largest letters. He may be known, but this is not sufficient; he should seek prominence, and employ all methods which do not violate his self respect.

AGREEABLENESS.

As a member of one of the many secret and benevolent organizations, besides deriving the benefit of their intended purposes, he can enlarge his circle of friendships and receive many favors through the peculiar clannishness of the membership. When such organizations, or those of churches, hold fairs, there is an opportunity for both benevolence and profit. Bread thus cast on the water may return in "pudding" later on. One of the best advertisements is agreeableness, if not carried to the extent of long credits on questionable premises. It is cheap, durable and broadening in its effects. The world is discursive and argumentative, but patience is a good investment, and when there is no moral or financial principle involved, assent to or tolerance of a customer's views strengthens his own favorable impressions of himself and invites the consideration of the good sense of his auditor. Such a man who is "always right," and his name is legion, is of course invariably wrong, and since it does not occupy much time for him to tell all he knows, the dealer can combine amusement with business

as the other becomes involved in labyrinthian verbal contortions.

MATTERS OF PRUDENCE.

To win a wager from a customer is often to lose his trade, and is a poor speculation to engage in. To forget the name of a frequent buyer is worse than forgetfulness — it is a crime against one's self.

It is by all means a matter of prudence to cultivate the good graces of the neighboring storekeepers. Aside from the mutual aid of recommendation, the sociability of the intercourse establishes an informal advisory committee against the fraudulent purchaser.

THE LOCAL PRESS.

The observance of some of the foregoing methods are distinctively within the legitimate province of advertising, but the local press should by no means be ignored as an important factor in extending and maintaining trade. The day of dreary announcements of 14 blurred "nonpareil" lines to the inch is past. Study something striking or ingenious in effect, and change the matter frequently. Better use but 2 inches of letterpress in half a column than fill it with commonplace statement. Cuts talk, but not those selected from the stock of a provincial paper, as they are too aged. Clever men prepare original ones, and such should be employed. Cultivate the editor. He is interesting and entertaining. It is his business to be so. Give him cause to remember you. Upon receipt of something new for stock let him see it, or delicately convey one to him, and the occasional reading column mention or recommendation may return its cost manifold.

Lectures on the World's Fair.

ARTHUR B. CLARKE, president of the Old Dominion Iron & Nail Works Company, Richmond, Va., visited the World's Fair some weeks ago, and on his return secured a large hall and delivered to the employees of the company, their families and other invited guests, a lecture on the great fair, which was richly illustrated with large stereopticon views. The instruction and entertainment was so popular that Mr. Clarke has been induced to repeat it several times with admittance charges, the proceeds being devoted to charitable objects of that city. Wherever delivered the houses are crowded, and many who could not visit the fair have had an enjoyable and instructive substitute. The interest thus shown in the pleasure and instruction of employees is worthy of a special commendation and might with advantage be imitated by other manufacturers.

MANY in the trade will be glad to know that Webster R. Walkley of the Peck, Stow & Wilcox Company, 29 Chambers street, New York, was elected on Tuesday alderman of the city of Brooklyn, which is to be congratulated on having a man of his character and caliber in this responsible position.

Trade Items.

NELSON B. WILLIAMS, well known to the Hardware trade of the West and Northwest, through his past extensive operations at Chicago, has permanently retired from business and is now residing temporarily at Colorado Springs, Col., to benefit the health of his wife. Mr. Williams for several years represented a number of large manufacturing establishments and built up for them a heavy trade in the district tributary to Chicago. His retirement will be regretted by his numerous friends and business acquaintances, but they are nevertheless pleased to know that he is so fortunate as to be able to retire from the harassing cares while yet in the prime of life.

THE H. & D. FOLSON ARMS COMPANY, 115 Murray street, New York, have recently added to their line the Columbian automatic ejecting Revolver. Reference is made to the lightness, strength and accuracy of the arm, which it is stated, possesses all the desirable features of those which preceded it, as well as some valuable improvements just added. It is made in .32 caliber for central fire cartridges, and has rebounding hammer. It has a steel cylinder, steel frame and rubber stocks. The metal parts are full plated or blued.

THE PARTNERSHIP heretofore existing between Frank F. Osborn and Geo. W. Alexander, under the firm name of Osborn & Alexander, doing a general Hardware business at 401 Market street, San Francisco, has been dissolved by mutual consent. Mr. Alexander will continue the business and collect all debts owing to and settle all indebtedness of the late firm. By the terms of agreement of dissolution Mr. Osborn is free to engage in the same line of business and deal with the customers of the old firm. As yet he has not perfected any plans, but he advises us that he will undoubtedly, in the near future, resume business in the old lines, namely, Hardware, Mechanics' Tools and Bicycles. Mr. Osborn has had 28 years' experience in the Hardware business at San Francisco, seven years as clerk and 21 years as an active partner in the firm of Osborn & Alexander.

HENRY B. ROBINSON, late with the Dana Hardware Company, Boston, and Walter H. Fox, late of Topping & Fox, New York, have formed a copartnership under the firm name of Robinson & Fox, and have opened offices at 35 Warren street, New York, and 186 Franklin street, Boston, where they will conduct the export commission business, making a specialty of supplying goods to the Newfoundland market. They state that they have closely allied themselves with a number of leading manufacturers of the United States, and confidently assure their patrons of the lowest manufacturers' prices. Mr. Robinson's long acquaintance and knowledge of the requirements of the trade is referred to as placing the firm in a position to meet every want. Mr. Fox is also widely and favorably known, and the firm will have the best wishes for their success.

ACOPARTNERSHIP has been formed between Joseph P. Reed, for many years connected with the Arnold Print Works, and J. Mortimer Darby, for eight years traveling salesman for Burlingame & Darbys, and they have opened a new Hardware store in North Adams, Mass. The store has been constructed with a special reference to the needs of a modern Hardware establishment, and the new firm have put in a complete stock of Shelf Hardware and builders' and manufacturers'

supplies. The firm opened for business November 4. Mr. Reed is referred to as a gentleman of excellent business qualifications, and while the Hardware business itself is entirely new to him, his partner, Mr. Darby, possesses a large experience in that line, and is regarded as well qualified to conduct it successfully.

E. BESSELL, SON & CO., 12 Murray street and 15 Park place, New York, will on November 14 and 15 conduct a large trade sale of Table and Pocket Cutlery, Carvers, Butcher Knives, Shears, &c. By order of the Emery-Waterhouse Company, in liquidation, they will also dispose of 1500 dozen Cast Steel Axes, assorted weights and brands. A large line of Skates and Silverware will also be offered, as appears by the auctioneers' Special Notice on another page. This is referred to as the last Cutlery sale of the season.

THE CLARK MFG. COMPANY, Buffalo, N. Y., have recently added several styles of surface and mortise Hinges for shutters to their line, including Cottage No. 1, Diamond No. 1, Clark's No. 65, Clark's Dixie L and P, and Clark's Buffalo reversible. A circular under date November 1, 1893, illustrates these and other patterns of Blind Hinges. The company also manufacture cast loose pin Butts, Sash Pulleys, Refrigerator trimmings—brass and bronze, all finishes—also special Hardware for insane asylums.

THE TRADE will note with interest the advertisement of the Capewell Horse Nail Company, Hartford, Conn., in which they illustrate their Capewell Horse Nail, emphasizing especially its tensile strength. Their patent Corrugated Horse Nail, which is also shown, will be regarded with interest.

J. W. VOORHIS & CO. is the style of a firm who, at 23 Warren street, New York, are now carrying on a business similar to that until recently conducted by the Butler Hardware Company at the same point, Mr. Voorhis having been connected with the latter firm. They have secured a portion of the stock held by the other concern and with additions will wholesale and retail Builders' Fine Hardware, Hand Elevators and Dumb Waiters, Hoisting Appliances, Contractors', Railroad and Factory Supplies, Mechanics' fine Tools, Refrigerators, Lawn Mowers, Stable Fittings, &c.

Price-Lists, Circulars, &c.

HENRY B. NEWHALL COMPANY, 105 Chambers street, New York: Supplement No. 1 to catalogue of 1892, covering Coburn's Track and Hangers. The supplement illustrates and describes, with prices, Parlor Door, Barn Door, Car Door, Fire Door and Elevator Door Hangers; Store Ladder Service, Overhead Carrying Track and Automatic Fire Shutter system. Store Ladder Service is given special attention, two styles of Ladders being shown. Coburn's patent Ladders or Steps have rollers at top and bottom, with a track at the top only, and stand across the aisle. Ladders facing shelves are shown for use where there is lack of space between the counter and ledge.

WITHINGTON & COOLEY MFG. COMPANY, Jackson, Mich.: Farm and Garden Tools. Their 1894 catalogue is bound in handsomely embossed paper covers, and contains illustrations, descriptions and prices of their line of goods. The company remark that it is their aim to improve the grades of their goods where possible, and that they exercise a constant vigilance over material, workmanship and design, that there may be no deterioration in the quality of their products.

STEWARD & ROMAINE MFG. COMPANY, 123 North Sixth street, Philadelphia, Pa.: Single and double patent parallel Expansion Bolts. Their 1894 illustrated catalogue and price-list show these goods in a variety of forms for different purposes: also Stirrups or Timber Hangers. Expansion Bolts are designed for use by engineers, builders, machinists, plumbers, railing manufacturers, and for all whose business requires the use of fastenings of great strength, security and easy application.

THE COLUMBIA GRAY IRON COMPANY, Columbia, Pa., with New York office 35 Warren street: Hardware, Iron novelties, House Furnishing Specialties and Toys. An illustrated catalogue and price-list calls attention to the increased line of goods the company are now making, also to the fact that in some instances the price-lists of their former line have been lessened. List prices and illustrations are given of Toy, Tack, Riveting and Upholstering Hammers, Toy Garden Tools, Banks, Hatchets, Hammers, Brackets, Can Openers, Clothes Line Hooks, Harness, Coat and Hat and Pivot Hooks, Drawer Pulls, Barrel Bolts, Latches, Match Safes, Flower Pot Brackets, Shutter Hinges, &c.

STRANSKY & CO., 27 Murray street, New York: Stransky Steel Ware. Illustrations show Cameo Ware; Royal Tea Pots finished in Cameo, inlaid and garnet, also All White Ware. Stransky Steel Ware is referred to as durable, pure, quick cooking and easily cleaned, and is made in all American shapes. A large line of the Cameo Ware is shown, including such goods as are usually found in Enamelled Ware. Import orders are taken for Blue and White Ware.

THE B. F. CUMMINS COMPANY, 232-234 South Clinton street, Chicago, for whom E. W. McClellan, 83 Nassau street, New York, is agent: Perforating Machines. Illustrations are shown of Check Perforators, Canceling Machines, Mutilating Perforators, Dating and Receipting Perforators, Consecutive Numbering Perforators, &c.

MORGAN & WRIGHT, 331-339 West Lake street, Chicago, Ill.: Pneumatic Tires. Illustrated pamphlets are devoted to descriptions of the valve, inner tube and the various shapes and sizes of Tires required to accommodate the Tires to all ordinary shapes of rims. Repair Outfit, Pumps and methods of repairing Tires are also illustrated, accompanied by directions.

A. TREDWAY & SONS HARDWARE COMPANY, Dubuque, Iowa: Fall circular for 1893. This is a nicely printed, broad page pamphlet of 40 pages, calling attention to a large line of goods, such as Axes, Saws, Scoops, Measures, Baskets, Corn Huskers, Metals, Stove Boards, Stove Shovels, Coal Hods, Stove Pipe Registers, Elbows, Lanterns, Washing Machines, Wringers, Coffee Mills, Meat Choppers, Revolvers, Shot, Skates, Mechanics' Tools, &c. The company have special brands of hand Tools made for them which are all branded "Wizard," comprising Axes, Buck Saws, Hand Saws, Hatchets, Nail Hammers, Scythes, Razors, Pocket Knives, Shovels, &c. An order blank and an addressed envelope are inclosed with each circular sent out.

THE NEVERSLIP HORSESHOE COMPANY, Boston, Mass.: Neverslip Horseshoes. In an illustrated catalogue Neverslip Shoes are shown in the various sizes, front and back, also worm calks for the shoes. It is remarked that the Neverslip removable, steel centered and self sharpening calks are made with a core of hardened steel within an outside covering of soft metal; and that whenever the calks

penetrate the ice or ground, the soft metal tends to wear away faster than the hard core and to leave the center projecting. These Shoes are made for both horses and mules.

It Is Reported—

That D. G. Warfield's Hardware store, at Oakdale, Cal., was destroyed by fire on the 20th ult.

That Wm. H. Lamb recently purchased the Hardware store of E. H. Robinson, at Santa Cruz, Cal. Mr. Lamb originally hailed from Syracuse, N. Y., but for ten years he was engaged in business in South Dakota.

That there is an opening for a Hardware store at Avoca, Mich.

That J. N. Smith has sold out his stock of Hardware at Denmark, Maine, and will retire to his farm.

That H. B. Dowse, West Concord, Vt., has sold out his Tin business to R. S. Brigham.

That O. Bennion of Strykersville, N. Y., has sold his Hardware business to a new firm, under the style of Griggs, Dellinger & Ellis.

That on the 27th ult. the Hardware store and tin shop of W. G. Keith, at Brookfield, Mass., was destroyed by fire. Loss, \$12,000; insurance, \$6500.

That the Mead Hardware Company's store, at Swanton, Vt., was burglarized on the 21st ult., and \$25 worth of goods taken.

That the Elkins Furniture & Hardware Company have been incorporated. The concern are located at Elkins, W. Va., and their stockholders are J. S. Posten, N. G. Keim, W. M. Pettingale, W. B. Vana and W. G. Wilson, all of Elkins.

That the Hardware store of M. J. Wilson, Penn Yan, N. Y., was entered by burglars on the 30th ult., and a large amount of Cutlery stolen.

That the new Hardware store of John Nuessle, Hamburg, N. Y., is nearly completed.

That the Hardware store of A. P. Boswell & Co., Coffeyville, Kan., was entered by burglars on the 31st ult., and \$163 in cash, negotiable notes to the value of \$5000 and certificates of deposit amounting to over \$18,000 were secured. Several Revolvers and Razors were added to the booty. Mr. Boswell is the Mayor of Coffeyville.

That F. C. Buell of Earlville, N. Y., and L. W. Farr of Massena, N. Y., have bought out the Hardware business of Tillotson Bros. of Earlville.

That John J. Cardwell, a Hardware merchant of Nebraska City, Neb., was married on the 24th ult. to Miss Bertha McNamar of Hiawatha. The ceremony took place at the latter point.

That the Hardware stores of Charles Halbach & Son and Foxwell & Moyle, Waterford, Wis., were robbed on the 26th ult.

That J. H. Strong has purchased at mortgage sale the Hardware stock of Mr. Woodworth, Onondaga, Mich.

That the W. H. Bartel Hardware business, at South Bend, Wash., has been disposed of to T. R. Brayton of Omaha, Neb., who took possession on October 16.

That E. H. Holmes & Co., Willimantic, Conn., will close out their stock of Stoves, Glassware, Crockery, &c. They will, however, continue the business of plumbing and house heating.

That S. S. Surdam of Oyster Bay, L. I., has removed to Hunt's Corners,

Cortland County, N. Y., where he has purchased and will conduct a Hardware store. Mr. Surdam is well known on Long Island, having served two years as school commissioner of the first district, and as such fulfilled his duties to the satisfaction of all.

That Samuel and Edward Junk have bought a two-thirds interest in the Graham Hardware Company, Rio, Ill.

That Robert and Joseph McNutt and William Moore have purchased the Hardware stock of Cooper & Bittle, Maryville, Tenn., and will continue the business at the old stand under the firm name of McNutt Bros. & Moore.

That W. G. Oliver has disposed of his Hardware business at Waupun, Wis., to Lovell & Co.

That the Hardware store of Jones Bros., Little Rock, Ark., was damaged by fire on the 5th inst. to the extent of \$48,000.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

There has been very little change in the character of business or in the general condition of the market for leading lines of Paints and Colors. As judged from the reports of distribution by jobbers, the consumption is nearly if not quite up to the average for this season of the year, and grinders have continued to take a very good amount of material used in their line. It is plain, however, that sellers are more anxious than buyers, and prices suffer more or less from this condition of affairs. That is to say, buyers who take round lots of stock on cash terms are shown remarkable favors in the form of special prices or liberal discounts from regular lists. Compared with that of the preceding week, there was room for improvement in the volume of business, although late distribution was generally represented as having been in excess of the movement a month ago.

White Lead.—A somewhat aggressive attitude is continued by corroders not identified with the combine, and, in a few instances, as low as 5¢ net was quoted for Dry White Lead in round lots for future delivery. Manufacturers of "quick process" and Mixed Leads have named prices relatively as low. The "combine" list remains unchanged, but does not appear to be closely adhered to in all quarters. In short, the market is somewhat ragged, with indications that the cheapness of raw material is gradually becoming a more potent factor, tending to bring about lower prices for the pigment. Business has been fair for the season, but spiritless.

Red Lead.—Dealings have been on a moderate scale and the demand at present is slow. Importers name previous prices for round lots, and the old list for domestic brands prevails. Still the market has a rather soft appearance, and small lots may be purchased, from second hands if not elsewhere, at prices somewhat below popular quotations.

Litharge.—Purchases of the low grade article by large consumers have been fairly liberal, chiefly for delivery a month or two ahead. Otherwise business continues to be of commonplace type and is moderate all told. Prices have undergone none but very slight change, but seem to tend a little in buyers' favor.

Orange Mineral.—Business has been of smaller volume and the demand at

present is rather slow. Former prices are generally asked, but the market is slightly soft in tone.

Zincs.—Deliveries of domestic Oxide have been fairly large and the indications are that consumption is fully up to the average. New demand is slow, however, and prices barely hold their own. Foreign brands are still more or less unsettled in price and find slow sale in competition with high grade domestic stock.

Colors, &c.—No important changes in prices have taken place during the past week, but the irregularity that has prevailed for some time past continues and it is the exception that lists are not "cut" more or less. Orders have been chiefly for moderate quantities and the demand at present is rather tame.

Oils and Turpentine.

Few new features have developed in the Oil market during the past week. A certain amount of irregularity has prevailed in prices of Cotton Seed and Menhaden products, and Whale Oil has receded in value under the weight of reports of a remarkably good catch this season. Neither strong points nor weak ones have induced dealers or consumers to take hold on a more liberal scale, however, and the market therefore remains in rather uncertain form, with the future dependent in a great measure upon general trade conditions. Speculation is almost at a standstill and without incentive to freer action.

Linseed Oil.—Prices remain precisely as they were a week ago. The tone of the market has not changed. Buyers have taken little or nothing beyond such lines as well defined wants necessitated and crushers have engaged in no new conflicts. Hence a fairly steady, although rather dull, market.

Cotton Seed Oils.—Transactions have been on a smaller scale the past week and demand from all quarters is tame. There is hardly any speculative interest and new export orders seem to be scarce. Fairly liberal quantities of both crude and refined product come upon the market as a matter of course. Prices are kept somewhat irregular thereby, but show no radical change from the figures that ruled a week ago.

Lard Oil.—The higher range of prices established last week has been maintained, since current production of city pressers and receipts from outside sources were closely taken up. Business has been of perfunctory character, however, and the demand at present is very tame.

Fish Oils.—Lower prices have been made on crude Whale Oil, and quotations for the products are lowered proportionately. Thus far the change has not stimulated buying, and the market is dull, as well as weak. The reduction on the manufactured Oils is to the basis of 45¢ for Natural Winter. Sperm Oils have undergone no change in price, but the market is soft and rather dull. Menhaden products have undergone no change in value and find slow sale.

Miscellaneous.—Common Olive Oil in barrels is irregular, with prices ranging from 55¢ @ 57¢ for lots for future shipment up to 60¢ @ 62¢ for spot parcels; the movement is rather slow. Cocoanut Oils are quoted about the same as they were last week, and meet with rather slow sale. Red Oils are unchanged and in moderate demand.

Spirits Turpentine.—Spot supplies have increased somewhat, and there is freer offering also of stock for future shipment. Under the influence of this fact, and merely ordinary demand, prices have receded to 30¢ for regular and 30½¢ for machine barrels.

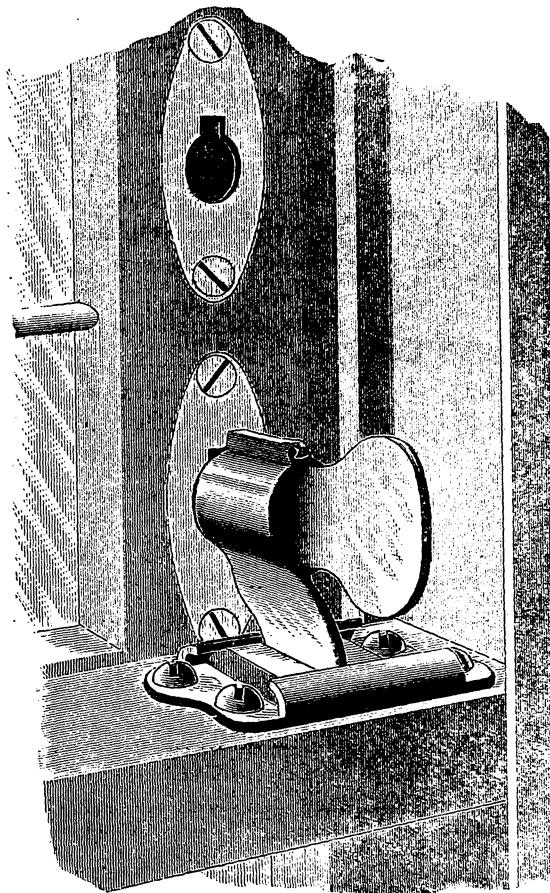
Bourke's Ventilating Sash Lock and Fastener.

The accompanying illustration shows a ventilating sash lock and fastener offered by the Bourke Mfg. Company, Youngstown, Ohio. It is made of malleable iron or of bronze metal, and is attached to the sash as shown in the

and prevents the rattling of the window. It is claimed that the lock is strong and simple in construction, and that having no weak points it will last a lifetime.

B. & M. Corn Knives.

Bruce & Marks Mfg. Company, Gas City, Ind., are offering corn knives, of



Bourke's Ventilating Sash Lock and Fastener.

cut. The plate is screwed to the top rail of the lower sash, and the two socket plates are attached to the upper sash at desired intervals. The opposite end of the thumb piece from the one shown corresponds in shape to the open-

which illustrations are herewith given. The blade of the Clipper corn knife, Fig. 1, is concaved from the back to the center along its entire length, and has a straight taper from the center to the cutting edge. Thus shaped, the metal



Fig. 1.—The Clipper Corn Knife.

ing in the plates into which it hooks. Encircling the hole at the back of each plate is a ridge so shaped that a partial revolution of the thumb piece draws the sash close together at the meeting rails. It is remarked that the device

gives the knife what the makers term a double back, and is referred to as insuring great strength and stiffness of blade. The blade is as thick at the center as on the extreme back, the object being to evenly distribute the

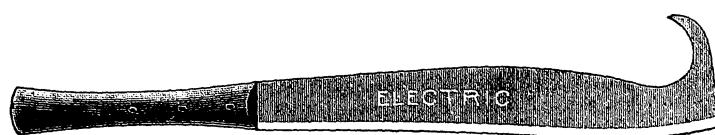


Fig. 2.—The Electric Corn Knife.

allows the window to be open from either top or bottom, or both, giving perfect ventilation and at the same time securely locking the window; also that drawing the upper and lower sash tightly together, it acts as a weather strip, shutting out rain, wind and dust,

weight of the metal. Another advantage claimed for the even distribution of metal is that it keeps the knife balanced and prevents constant tendency to turn in the hand. It is remarked that the shape of the metal enables a blade to be constructed of considerably less

width than is usual, thereby greatly reducing the atmospheric resistance when swinging the knife through the air. The knife is made in three sizes, and although designed for corn cutting it can be used for a variety of purposes. The knife shown in Fig. 2 has a hook for picking up corn that has been blown down, the hook being designed to obviate the necessity of stooping over to lift the corn.

Self Piercing Bull Ring.

The self piercing bull ring herewith illustrated is being offered by Peck, Stow & Wilcox Company, Southington, Conn., and 27 Chambers street, New York. The point of the ring, as shown at the top of the cut in Fig. 1, is pointed and has beveled shoulders, the other

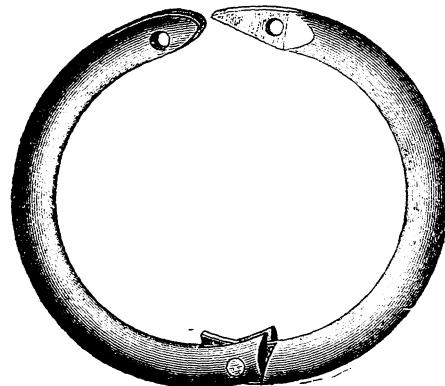


Fig. 1.—Self Piercing Bull Ring.

end of the ring being so cut as to make a perfectly smooth joint when the ends of the ring are joined. The pointed portion of the ring is designed to obviate the necessity of cutting a hole or using an awl previous to inserting the ring in



Fig. 2.—Screw Driver for Self Piercing Bull Ring.

the animal's nose. Fig. 2 represents the flat steel screw driver which accompanies the ring.

Climax Coal Screens.

The Gilbert & Bennett Mfg. Company, 148 Lake street, Chicago, and 44 Cliff street, New York, have just brought out a coal screen adapted for use either on the side of a car or in a yard. Two illustrations are herewith given, one showing how the Climax screen is secured to a car for screening into a wagon and the other showing how the same screen is adapted for yard use by the addition of a head board and a foot rest. In using it on a car the clamps are secured to the side board and the iron leg adjusts it to the required incline, holding the screen firm and independent of the wagon. If it is wanted to screen from a box car it can be secured to the grain door, or one or two or more planks can be fastened together for the right height long enough

to rest against the inside of the door frame. This will also serve to keep the coal from rolling out on the ground. For yard use the clamps are secured to the foot board, and the head board is fastened in position. The screen can be placed at any required incline and

The Sensible Ice Tool.

N. R. Streeter & Co., Groton, N. Y., are offering an ice tool as herewith shown. It is made of cast iron, with sharpened steel points, and measures 9

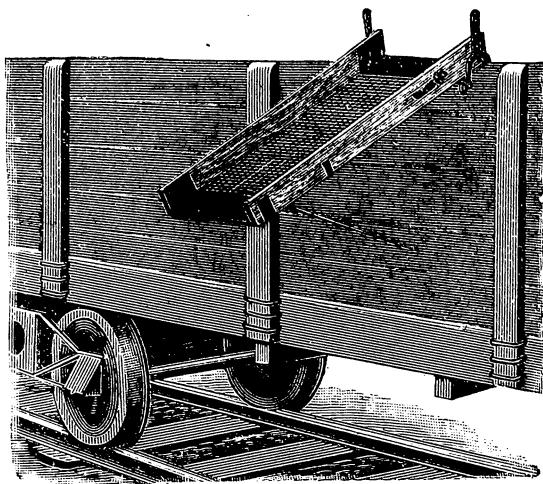
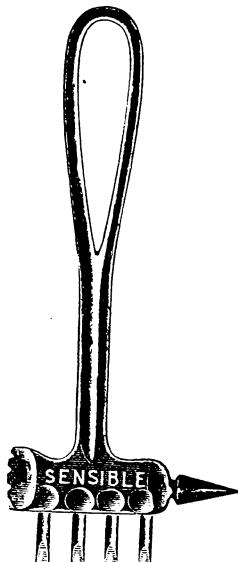


Fig. 1.—Climax Screen on Car.

the clamps secured so the foot board is always vertical, rendering the screen firm to shovel against. The screen will also stand solid. The screens are constructed substantially and at the same time with a view to making them just as light as possible. Double crimped steel cloth is used. The frames are hardwood and covered with heavy sheet iron where the coal rolls down. The sides are strengthened by strong iron braces. The legs and clamps are strong and capable of quick adjustment. There are as few parts as possible to

inches over all. The article is referred to as a combination of an ice pick, chisel, pulverizer and hammer, and as



The Sensible Ice Tool.

being well adapted to use in any of these capacities. The tool is designed to retail for 15 cents.

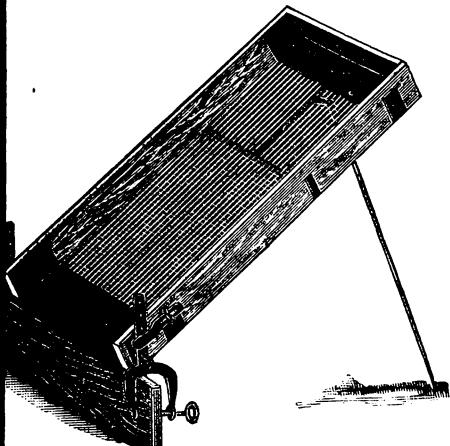


Fig. 2.—Climax Screen for Yard Use.

render the screen complete. All meshes are furnished from $\frac{3}{16}$ inch to 3 inches, but for general use the $\frac{3}{8}$ inch is recommended.

HENRY B. TODD has sold his manufacturing business at Meriden, Conn., to Proudman Bros. of that place, who will in the future supply the trade with the goods formerly made by him, including the Yankee Eave Trough Hangers, Giant Metal Cutter and Meriden Cutting Nippers.

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Covert's Rope, 7-16 in., Jute.....	70&2%	Hinges—		55&10@10@10%	Bradley's.....	38%	
Covert's Rope, 1/4 in., Hemp.....	50&2%	Blind Hinges—		Harness, Reading List.....	Adjustable Handle.....	26@33%	
Covert's Adj. Web Halters.....	40&2%	Parker.....	75@75&10%	55&10@10@10%	Wilkinson's Folding.....	26@25&5%	
Covert's Hemp Horse and Cattle Tie,.....	50&10@2%	Huffer.....	50%	Coat and Hat, Sargent's List.....			
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Covert's Jute Cattle Ties.....	70&10@2%	Clark's Mortise Gravity.....	50%	Coat and Hat, Moore's.....	10%		
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Atha Tool Co.		Queen City Reversible.....	70&10@25@70@75@10%				
Verree.....		Chicago, Luk & Porter, Nos. 0, 1, 12, 2, 25, 3,.....	75@10@25@70@75@10%				
C. Hammond & Son.....	40&10@-5%	North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50.....	10%				
Fayette R. Plum, Artisan's Choice, A. E. Nall.....	40&10%	Shepard's.....	80&10@25@70@75@10%				
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3 lb. and under.....	75@35%	Western.....	70@25@10@60@60@10% N. E.				
3 to 5 lb.	75@36%	70@25@10@60@10% N. E.					
Over 5 lb.	85@4%	Wire Coat and Hat, Gem, list April, 1886.....	60@30@10%				
Wilkinson's Smiths.....	10@11@14@15@	Wire Coat and Hat, Miles, list April, 1886.....	60@30@10%				
Handcuffs and Leg Irons—							
—See Police Goods.							
Handles—							
Cross-Cut Saw Handles—							
Atkins', new list.....	40%	Indestructible Coat and Hat, Hat, 45@45@55%					
Champion.....	15%	Wire Coat and Hat, Standard.....	60@30@10%				
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Sensible.....	40%	Steady Ceiling Hooks.....	50@10@60%				
Iron, Wrought or Cast—		Belt.....	80@15@80@20%				
Door or Thumb, Nos. 0, 1, 2, 3, 4.....	60@10@10%	Atlas, Coat and Hat.....	65%				
Per doz. \$0.90 1.00 1.08 1.35 1.50.....		Williamson's Bird Cage Hooks, List April, 1892.....	40%				
Roggan's Latches, \$1.00 doz 30@45@55@60@65@70@75@80@85@90@95@100@105@110@115@120@125@130@135@140@145@150@155@160@165@170@175@180@185@190@195@200@205@210@215@220@225@230@235@240@245@250@255@260@265@270@275@280@285@290@295@300@305@310@315@320@325@330@335@340@345@350@355@360@365@370@375@380@385@390@395@400@405@410@415@420@425@430@435@440@445@450@455@460@465@470@475@480@485@490@495@500@505@510@515@520@525@530@535@540@545@550@555@560@565@570@575@580@585@590@595@600@605@610@615@620@625@630@635@640@645@650@655@660@665@670@675@680@685@690@695@700@705@710@715@720@725@730@735@740@745@750@755@760@765@770@775@780@785@790@795@800@805@810@815@820@825@830@835@840@845@850@855@860@865@870@875@880@885@890@895@900@905@910@915@920@925@930@935@940@945@950@955@960@965@970@975@980@985@990@995@1000@1005@1010@1015@1020@1025@1030@1035@1040@1045@1050@1055@1060@1065@1070@1075@1080@1085@1090@1095@1100@1105@1110@1115@1120@1125@1130@1135@1140@1145@1150@1155@1160@1165@1170@1175@1180@1185@1190@1195@1200@1205@1210@1215@1220@1225@1230@1235@1240@1245@1250@1255@1260@1265@1270@1275@1280@1285@1290@1295@1300@1305@1310@1315@1320@1325@1330@1335@1340@1345@1350@1355@1360@1365@1370@1375@1380@1385@1390@1395@1400@1405@1410@1415@1420@1425@1430@1435@1440@1445@1450@1455@1460@1465@1470@1475@1480@1485@1490@1495@1500@1505@1510@1515@1520@1525@1530@1535@1540@1545@1550@1555@1560@1565@1570@1575@1580@1585@1590@1595@1600@1605@1610@1615@1620@1625@1630@1635@1640@1645@1650@1655@1660@1665@1670@1675@1680@1685@1690@1695@1700@1705@1710@1715@1720@1725@1730@1735@1740@1745@1750@1755@1760@1765@1770@1775@1780@1785@1790@1795@1800@1805@1810@1815@1820@1825@1830@1835@1840@1845@1850@1855@1860@1865@1870@1875@1880@1885@1890@1895@1900@1905@1910@1915@1920@1925@1930@1935@1940@1945@1950@1955@1960@1965@1970@1975@1980@1985@1990@1995@2000@2005@2010@2015@2020@2025@2030@2035@2040@2045@2050@2055@2060@2065@2070@2075@2080@2085@2090@2095@2100@2105@2110@2115@2120@2125@2130@2135@2140@2145@2150@2155@2160@2165@2170@2175@2180@2185@2190@2195@2200@2205@2210@2215@2220@2225@2230@2235@2240@2245@2250@2255@2260@2265@2270@2275@2280@2285@2290@2295@2300@2305@2310@2315@2320@2325@2330@2335@2340@2345@2350@2355@2360@2365@2370@2375@2380@2385@2390@2395@2400@2405@2410@2415@2420@2425@2430@2435@2440@2445@2450@2455@2460@2465@2470@2475@2480@2485@2490@2495@2500@2505@2510@2515@2520@2525@2530@2535@2540@2545@2550@2555@2560@2565@2570@2575@2580@2585@2590@2595@2600@2605@2610@2615@2620@2625@2630@2635@2640@2645@2650@2655@2660@2665@2670@2675@2680@2685@2690@2695@2700@2705@2710@2715@2720@2725@2730@2735@2740@2745@2750@2755@2760@2765@2770@2775@2780@2785@2790@2795@2800@2805@2810@2815@2820@2825@2830@2835@2840@2845@2850@2855@2860@2865@2870@2875@2880@2885@2890@2895@2900@2905@2910@2915@2920@2925@2930@2935@2940@2945@2950@2955@2960@2965@2970@2975@2980@2985@2990@2995@3000@3005@3010@3015@3020@3025@3030@3035@3040@3045@3050@3055@3060@3065@3070@3075@3080@3085@3090@3095@3100@3105@3110@3115@3120@3125@3130@3135@3140@3145@3150@3155@3160@3165@3170@3175@3180@3185@3190@3195@3200@3205@3210@3215@3220@3225@3230@3235@3240@3245@3250@3255@3260@3265@3270@3275@3280@3285@3290@3295@3300@3305@3310@3315@3320@3325@3330@3335@3340@3345@3350@3355@3360@3365@3370@3375@3380@3385@3390@3395@3400@3405@3410@3415@3420@3425@3430@3435@3440@3445@3450@3455@3460@3465@3470@3475@3480@3485@3490@3495@3500@3505@3510@3515@3520@3525@3530@3535@3540@3545@3550@3555@3560@3565@3570@3575@3580@3585@3590@3595@3600@3605@3610@3615@3620@3625@3630@3635@3640@3645@3650@3655@3660@3665@3670@3675@3680@3685@3690@3695@3700@3705@3710@3715@3720@3725@3730@3735@3740@3745@3750@3755@3760@3765@3770@3775@3780@3785@3790@3795@3800@3805@3810@3815@3820@3825@3830@3835@3840@3845@3850@3855@3860@3865@3870@3875@3880@3885@3890@3895@3900@3905@3910@3915@3920@3925@3930@3935@3940@3945@3950@3955@3960@3965@3970@3975@3980@3985@3990@3995@4000@4005@4010@4015@4020@4025@4030@4035@4040@4045@4050@4055@4060@4065@4070@4075@4080@4085@4090@4095@4100@4105@4110@4115@4120@4125@4130@4135@4140@4145@4150@4155@4160@4165@4170@4175@4180@4185@4190@4195@4200@4205@4210@4215@4220@4225@4230@4235@4240@4245@4250@4255@4260@4265@4270@4275@4280@4285@4290@4295@4300@4305@4310@4315@4320@4325@4330@4335@4340@4345@4350@4355@4360@4365@4370@4375@4380@4385@4390@4395@4400@4405@4410@4415@4420@4425@4430@4435@4440@4445@4450@4455@4460@4465@4470@4475@4480@4485@4490@4495@4500@4505@4510@4515@4520@4525@4530@4535@4540@4545@4550@4555@4560@4565@4570@4575@4580@4585@4590@4595@4600@4605@4610@4615@4620@4625@4630@4635@4640@4645@4650@4655@4660@4665@4670@4675@4680@4685@4690@4695@4700@4705@4710@4715@4720@4725@4730@4735@4740@4745@4750@4755@4760@4765@4770@4775@4780@4785@4790@4795@4800@4805@4810@4815@4820@4825@4830@4835@4840@4845@4850@4855@4860@4865@4870@4875@4880@4885@4890@4895@4900@4905@4910@4915@4920@4925@4930@4935@4940@4945@4950@4955@4960@4965@4970@4975@4980@4985@4990@4995@5000@5005@5010@5015@5020@5025@5030@5035@5040@5045@5050@5055@5060@5065@5070@5075@5080@5085@5090@5095@5100@5105@5110@5115@5120@5125@5130@5135@5140@5145@5150@5155@5160@5165@5170@5175@5180@5185@5190@5195@5200@5205@5210@5215@5220@5225@5230@5235@5240@5245@5250@5255@5260@5265@5270@5275@5280@5285@5290@5295@5300@5305@5310@5315@5320@5325@5330@5335@5340@5345@5350@5355@5360@5365@5370@5375@5380@5385@5390@5395@5400@5405@5410@5415@5420@5425@5430@5435@5440@5445@5450@5455@5460@5465@5470@5475@5480@5485@5490@5495@5500@5505@5510@5515@5520@5525@5530@5535@5540@5545@5550@5555@5560@5565@5570@5575@5580@5585@5590@5595@5600@5605@5610@5615@5620@5625@5630@5635@5640@5645@5650@5655@5660@5665@5670@5675@5680@5685@5690@5695@5700@5705@5710@5715@5720@5725@5730@5735@5740@5745@5750@5755@5760@5765@5770@5775@5780@5785@5790@5795@5800@5805@5810@5815@5820@5825@5830@5835@5840@5845@5850@5855@5860@5865@5870@5875@5880@5885@5890@5895@5900@5905@5910@5915@5920@5925@5930@5935@5940@5945@5950@5955@5960@5965@5970@5975@5980@5985@5990@5995@5100@5105@5110@5115@5120@5125@5130@5135@5140@5145@5150@5155@5160@5165@5170@5175@5180@5185@5190@5195@5200@5205@5210@5215@5220@5225@5230@5235@5240@5245@5250@5255@5260@5265@5270@5275@5280@5285@5290@5295@5300@5305@5310@5315@5320@5325@5330@5335@5340@5345@5350@5355@5360@5365@5370@5375@5380@5385@5390@5395@5400@5405@5410@5415@5420@5425@5430@5435@5440@5445@5450@5455@5460@5465@5470@5475@5480@5485@5490@5495@5500@5505@5510@5515@5520@5525@5530@5535@5540@5545@5550@5555@5560@5565@5570@5575@5580@5585@5590@5595@5600@5605@5610@5615@5620@5625@5630@5635@5640@5645@5650@5655@5660@5665@5670@5675@5680@5685@5690@5695@5700@5705@5710@5715@5720@5725@5730@5735@5740@5745@5750@5755@5760@5765@5770@5775@5780@5785@5790@5795@5800@5805@5810@5815@5820@5825@5830@5835@5840@5845@5850@5855@5860@5865@5870@5875@5880@5885@5890@5895@5900@5905@5910@5915@5920@5925@5930@5935@5940@5945@5950@5955@5960@5965@5970@5975@5980@5985@5990@5995@5100@5105@5110@5115@5120@5125@5130@5135@5140@5145@5150@5155@5160@5165@5170@5175@5180@5185@5190@5195@5200@5205@5210@5215@5220@5225@5230@5235@5240@5245@5250@5255@5260@5265@5270@5275@5280@5285@5290@5295@5300@5305@5310@5315@5320@5325@5330@5335@5340@5345@5350@5355@5360@5365@5370@5375@5380@5385@5390@5395@5400@5405@5410@5415@5420@5425@5430@5435@5440@5445@5450@5455@5460@5465@5470@5475@5480@5485@5490@5495@5500@5505@5510@5515@5520@5525@5530@5535@5540@5545@5550@5555@5560@5565@5570@5575@5580@5585@5590@5595@5600@5605@5610@5615@5620@5625@5630@5635@5640@5645@5650@5655@5660@5665@5670@5675@5680@5685@5690@5695@5700@5705@5710@5715@5720@5725@5730@5735@5740@5745@5750@5755@5760@5765@5770@5775@5780@5785@5790@5795@5800@5805@5810@5815@5820@5825@5830@5835@5840@5845@5850@5855@5860@5865@5870@5875@5880@5885@5890@5895@5900@5905@5910@5915@5920@5925@5930@5935@5940@5945@5950@5955@5960@5965@5970@5975@5980@5985@5990@5995@5100@5105@5110@5115@5120@5125@5130@5135@5140@5145@5150@5155@5160@5165@5170@5175@5180@5185@5190@5195@5200@5205@5210@5215@5220@5225@5230@5235@5240@5245@5250@5255@5260@5265@5270@5275@5280@5285@5290@5295@5300@5305@5310@5315@5320@5325@5330@5335@5340@5345@5350@5355@5360@5365@5370@5375@5380@5385@5390@5395@5400@5405@5410@5415@5420@5425@5430@5435@5440@5445@5450@5455@5460@5465@5470@5475@5480@5485@5490@5495@5500@5505@5510@5515@5520@5525@5530@5535@5540@5545@5550@5555@5560@5565@5570@5575@5580@5585@5590@5595@5600@5605@5610@5615@5620@5625@5630@5635@5640@5645@5650@5655@5660@5665@5670@5675@5680@5685@5690@5695@5700@5705@5710@5715@5720@5725@5730@5735@5740@5745@5750@5755@5760@5765@5770@5775@5780@5785@5790@5795@5800@5805@5810@5815@5820@5825@5830@5835@5840@5845@5850@5855@5860@5865@5870@5875@5880@5885@5890@5895@5900@5905@5910@5915@5920@5925@5930@5935@5940@5945@5950@5955@5960@5965@5970@5975@5980@5985@5990@5995@5100@5105@5110@5115@5120@5125@5130@5135@5140@5145@5150@5155@5160@5165@5170@5175@5180@5185@5190@5195@5200@5205@5210@5215@5220@5225@5230@5235@5240@5245@5250@5255@5260@5265@5270@5275@5280@5285@5290@5295@5300@5305@5310@5315@5320@5325@5330@5335@5340@5345@5350@5355@5360@5365@5370@5375@5380@5385@5390@5395@5400@5405@5410@5415@5420@5425@5430@5435@5440@5445@5450@5455@5460@5465@5470@5475@5480@5485@5490@5495@5500@5505@5510@5515@5520@5525@5530@5535@5540@5545@5550@5555@5560@5565@5570@5575@5580@5585@5590@5595@5600@5605@5610@5615@5620@5625@5630@5635@5640@5645@5650@5655@5660@5665@5670@5675@5680@5685@5690@5695@5700@5705@5710@5715@5720@5725@5730@5735@5740@5745@5750@5755@5760@5765@5770@5775@5780@5785@5790@5795@5800@5805@5810@5815@5820@5825@5830@5835@5840@5845@5850@5855@5860@5865@5870@5875@5880@5885@5890@5895@5900@5905@5910@5915@5920@5925@5930@5935@5940@5945@5950@5955@5960@5965@5970@5975@5980@5985@5990@5995@5100@5105@5110@5115@5120@5125@5130@5135@5140@5145@5150@5155@5160@5165@5170@5175@5180@5185@5190@5195@5200@5205@5210@5215@5220@5225@5230@5235@5240@5245@5250@5255@5260@5265@5270@5275@5280@5285@5290@5295@5300@5305@5310@5315@5320@5325@5330@5335@53							

Britain, Graham & Mathes, list Jan. 1890.....	.00 & 10%		Auburn Thistle.....	.30 & 10@30 & 10%
Plate.....	.33 & 62%		Ohio.....	.30 & 10@30 & 10%
Barnes Mfg. Co. ....	.40 & 10@10%		Sandusky.....	25%
Yale.....	net prices		L. & I. J. White.....	25%
Deitz Flat Key.....	.30%		Stanley R. & L. Co.	50 & 10%
Romer's Night Latches.....	.15%		Plates—	
Brooklyn Latches.....	.50 & 10%		Fellow.....	25% ^{in 6@61%}
Warner's Burglar Proof. # doz. \$8.00, 50%			Pliers and Nippers—	
Elevator—			Button's Patent.....	60%
Moore's.....	.83 1/2%		Hall's No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 ^{# doz.}	40%
Padlocks—			Humason & Beckley Mfg. Co. 50@50 & 10%	
List June 10, 1891.	.50 & 2%		Lindsay's Gaint.....	33 1/3%
Norwich Lock Mfg. Co., old list.....	.50 & 2%		Gas Pliers.....	60%
Yale Lock Mfg. Co. &.....	net prices		Eureka Pliers and Nippers.....	40%
Eagle.....	.40%		Russell's Parallel.....	25%
Eureka, Eagle Lock Co. ....	.40 & 2%		P. S. & W. Cast Steel.....	50@50 & 2%
Romer's No. 0 to 91.....	.30%		P. S. & W. Timmer's Cutting Nippers.....	10%
Romer's Scandinavian, &c., Nos. 100 to 505.....	.15%		Carew's Pat. Wire Cutters.....	20%
A. E. Deitz.....	.40%		Morrill's Parallel. # doz. \$12.00.....	30 & 10%
Champion Padlocks.....	.40%		Cronk's 3 in., \$15.00; 10 in., \$20	
Hotchkiss.....	.30%		Cronk's Button Pattern.....	50 & 10@60%
Star.....	.60%		Cronk's Carrier Pliers.....	60@60 & 10%
Horseshoe.....	# doz. \$9.50@50 & 10%			
Barnes Mfg. Co. ....	.40@40 & 10%		Plumbs and Levels—	
Noek's.....	.30%		Regular List.....	75 & 10@75 & 10 & 10%
Scandinavian.....	.60 & 40%		Stanley's Duplex.....	20 & 10%
E. T. Fraim's Keystone Scandinavian, 1010 line.....	.90 & 40%		Stanley's Handy.....	20 & 10%
120 line.....	.90 & 25%		Disc's.....	50%
109 line.....	.65%		Cook's.....	40 & 10%
510 line.....	.70 & 10%		Pocket Levels.....	70 & 10@70 & 10 & 10%
225, 610 and 200 lines.....	.70%		Davis Iron Levels.....	30%
All other numbers.....	.50 & 5%		Davis Inclinometers.....	10 & 10%
Ames Sword Co. up to No. 150.....	.40%			
Ames Sword Co. above No. 150.....	.50%			
Slaymaker, Barry & Co. No. 1010 line.....	.90 & 5%			
No. 41 line.....	.50%			
No. 61 line.....	.60%			
No. 21 line.....	.80%			
Sash, &c.—				
Clark's No. 1, \$10; No. 2, \$8 3 gr.	33 1/2%			
Ferguson's.....	33 1/2%			
Vicor.....	.60 & 10 & 2%			
Walker's.....	.10%			
Attwell Mfg. Co. ....	.25 & 33 1/2%			
Reading.....	.66 1/4 & 10@66 1/4 & 10 & 10%			
Hammond's Window Springs.....	.40%			
Common Sense, Jap'd. & Co'd. and Er'zed.....	.5 gr \$4.00			
Common Sense, Nickel Plated, # gr \$10.00				
Universal.....	.50%			
Kempshall's Gravity.....	.60%			
Kempshall's Model.....	.60@60 & 10%			
Corbin's Daisy, list Feb. 15, 1888.....	.70%			
Payson's Perfect.....	.60 & 10 & 10%			
Hugunin's Sash Balances.....	.25 & 5 & 2%			
Hugunin's New Sash Locks.....	.25 & 5 & 2%			
Ives' Patent.....	.60 & 10 & 10@10 & 10%			
Fish (Liesche's pat.), No. 100, # gr. \$8.....				
No. 105, # gr. \$10.....	.50%			
Davis Bronze, Barnes Mfg. Co. ....	.60%			
Champion Safety list January, 1893. 70 & 5%				
Security.....	.70%			
Giant, list Jan. 1892.....	.70 & 5%			
Wolcott's.....	.60 & 10 & 5%			
Monarch.....	.50%			
Lumber Tools—				
See Tools, Lumber.				
Lustro—				
Four-ounce bottles.....	# doz. \$1.75; # gross			
	\$17.00			
Machines.				
Boring—				
Without Augers. Upright, Angular.				
Douglas.....	.65 50 \$6.75, 50%			
Snell's, Rice's Pat. ....	.65 50 6.75 & 10 & 10%			
Jennings.....	.55 50 6.75, 50@50 & 5%			
Other Machines. 2.25 2.50.....				
Phillip's Patent with Augur. 7.00 7.50.....				
Millers Falls.....	.75.00			
Boss, Carpenters' 3.60				
Boss, Ship Builders' 3.85				
Fluting—				
Knox, 4 1/2-Inch Rolls.....	\$3.25 each			
Knox, 6-Inch Rolls.....	.50 60 \$6.75, 50%			
Eagle, 3 1/2-Inch Rolls, \$2.15.....	.35%			
Eagle, 5 1/2-Inch Rolls, \$2.85.....	.35%			
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in., \$5.50 each.....	.35%			
Crown, Jewel, 6 in., \$3.50 each; 8 in., \$5.50 each; American, 5 in., \$3.00; 6 in., \$3.50; 7 in., \$4.50 each.....	.35%			
Domestic Fluter, White Metal, each, \$1.50				
Geneva Hand Fluter, White Metal, # doz. \$12.25				
Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00; 4, \$8.25.....	.30%			
Shepard Hand Fluter, No. 50, per doz \$15.50.....				
Shepard Hand Fluter, No. 110, # doz \$11.00.....	.40%			
Shepard Hand Fluter, No. 95, # doz \$3.00.....	.40%			
Combined Fluter and Sash Iron, # doz \$15.00.....	.40%			
Hoisting—				
Moore's Hand Hoist, with Lock Brake, 20%				
Moore's Anti-Friction Differential Pulley Block.....	.20%			
Moore's Rope Differential Pulley Block.....	.20%			
Energy Mfg. Co.'s, See also Blocks. ....	.60%			
Washing—				
Anthony Wayne, # doz. No. 1, \$42; No. 2, \$36; No. 3, \$42.				
Wayne American.....	# doz. \$36.00			
Western Star # doz. No. 2, \$36; No. 3, \$39				
Welsell.....	# doz \$54.00			
Fair and Square.....	# doz \$42.00			
Mallets—				
Hickory.....	.20 & 10@20 & 10 & 10%			
Lignumvitae.....	.20 & 10@20 & 10 & 10%			
B. & L. Block Co., Hickory & L. V. 30@30 & 10%				
Mattocks—	Regular list.			
60@10@60 & 10 & 10%				
Measures—				
Standard Fibreware, No. 1, peak # dozen \$3.50; 1/2 peak, \$3.00				
Meat Cutters—				
See Cutters, Meat.				
Menders, Harness—				
Per doz.....	\$2.00			
Milk Cans—	See Cans, Milk.			
Mills—				
Coffee—				
Box and Side, List Jan. 1, 1888. 80@60 & 5%				
Net prices are often made which are lower than above discount.				
American, Enterprise Mfg. Co., list Jan. 17, 1893.....	.20%			
The Swift, Lane Bros. ....	.30%			
Waddell's New Box Mills, Ideal Brand, New List.....	.60%			
Mincing Knives—				
See Knives, Mincing.				
Molasses Gates—				
See Gates, Molasses.				
Money Drawers—				
See Drawers, Money.				
Mowers, Lawn—				
Best Machines: 10-in., \$4; 12-in., \$4.50; 14-in., \$5; 16-in., \$5.50; 18-in., \$6.				
Low-Grade Machines: 10-in. \$3; 12-in., \$3.25 14-in., \$3.50 each				
Muzzles—				
Safety.....	# doz. \$3.00, 25%			
Nails.—				
Cut and Wire. See Trade Report.				
Wire Nails, Papered.				
Association list, May 1, '92.....	.85 & 5%			
Tack, Tacks, list. ....	.70 & 60@70 & 10%			
Hungarian, Finishing, Upholsterers', &c. See Tacks.				
Nails—				
Horse—				
American.....	.94 94 94 94 94 94 .net			
Ausable.....	.28 26 26 24 24 24			
Clinton, Fin. 17 1/2 16 1/2 15 1/2 14 1/2 13 1/2 12 1/2	.40 & 5 & 2%			
Essex.....	.28 26 26 24 24 24			
Lyra.....	.94 1 1 1 1 1 .net			
Snowden.....	.94 1 1 1 1 1 .net			
Standard.....	.23 21 20 19 18 17			
Vulcan.....	.23 21 20 19 18 17			
Northwest.....	.23 23 22 21 20 19			
C. B. K. ....	.25 23 22 21 21 21			
A. C. ....	.25 23 22 21 21 21			
Baldwin.....	.25 23 22 21 21 21			
Bonanza.....	.25 23 22 21 21 21			
Daisy.....	.25 23 22 21 21 21			
Dale.....	.25 23 22 21 21 21			
Eclipse.....	.25 23 22 21 21 21			
Bureau, 1898.....	.25 23 22 21 21 21			
Kelly State.....	.25 23 22 21 21 21			
Favorite.....	.25 23 22 21 21 21			
Gold Medal.....	.25 23 22 21 21 21			
Imperial Bay State.....	.25 23 22 21 21 21			
Little Star.....	.25 23 22 21 21 21			
Monarch.....	.25 23 22 21 21 21			
New Lighting.....	.25 23 22 21 21 21			
Oriole.....	.25 23 22 21 21 21			
Perfection.....	.25 23 22 21 21 21			
Pomona.....	.25 23 22 21 21 21			
Rocking Table.....	.25 23 22 21 21 21			
Turn Table.....	.25 23 22 21 21 21			
Victor.....	.25 23 22 21 21 21			
Waverly.....	.25 23 22 21 21 21			
White Mountain.....	.25 23 22 21 21 21			
Reading 72.....	.25 23 22 21 21 21			
Reading 78.....	.25 23 22 21 21 21			
Nail Pullers—	See Pullers, Nail.			
Nail Sets—	See Sets, Nail.			
Nut Crackers—	See Crackers, Nut.			
Nuts—	List Dec. 18, 1889.			
Square, Hex.				
Hot Pressed.....	.6.80 & 6.50 off list			
Cold Punched.....	.5.00 & 5.10 off list			
In packages of 100 #, add 1-10¢ # doz. net; in packages less than 100 #, add 3¢ # doz. net.				
Oakum—				
Beat or Government.....	# doz. 63@71 1/2			
U. S. Navy.....	# doz. 55@53			
Navy.....	# doz. 55@54			
Oakum—				
Prize Fruit Pickers.....	50%			
Picks—				
Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00.....	60@10 & 5@10 & 10 & 5%			
Boiler Tubes, list Oct. 24, 1892.....	.55 & 10%			
Casing, list Nov. 16, 1892.....	.52 & 10%			
Indented Joints Casing, list Nov. 16, 1892.....	.57 & 10%			
Steel Boiler Tubes.....	.57 & 10%			
Cold Drawn Seamless Steel Tubing.....	.56 & 10%			
Planes and Plane Irons—				
Molding.....	40 & 10%			
Bench, First quality.....	45 & 10%			
Bench, Second quality.....	50 & 10%			
Bailey's (Stanley R. & L. Co.) .....	.60 & 10%			
Iron Planes—				
Bailey's (Stanley R. & L. Co.) .....	.50 & 10%			
Miscellaneous Planes (Stanley R. & L. Co.) .....	.50 & 10%			
Steers' Iron Planes.....	.50 & 10%			
Devil's Iron Planes.....	.56 & 10%			
Birmingham Plane Co. ....	.60 & 10 & 5%			
Gage Tool Co.'s Self-Setting.....	.20 & 10 & 10%			
Chaplin's Iron Planes.....	.50 & 10 & 5%			
Sargent's.....	.60 & 10 & 10%			
Standard Tool Co. ....	.50 & 10 & 5%			
Plane Irons—				
Butcher's.....	\$5.00 & \$5.25 to \$5.50			
Buck Bros.	\$5.00			
Powder—				
In Canisters—				
Fine Sporting, 1 lb. each.....				
Duck, 1 lb. each.....				
Bench, 1 lb. each.....				
Rifle, 1/2 lb. each.....				
In Kegs—				
Rifle, 25-lb. kegs.....				
Rifle, 12 1/2-lb. kegs.....				
Rifle, 6 1/2-lb. kegs.....				
Duck, 25-lb. kegs.....				
Duck, 12 1/2-lb. kegs.....				
Duck, 6 1/2-lb. kegs.....				
Rifle, 3 1/2-lb. kegs.....				
Presses—				
Fruit and Jelly—				
Enterprise Mfg. Co.	25%			
Hensil.....	# doz. \$3.50			
Shepard's Queen City.....	40%			
Silver & Co.	# doz. \$2.75			
Pruning Hooks and Shears—	See Shears.			

Pullers Nail-

Sornton. \$ per doz. \$18.00, 83¢
Giant, No. 1. \$ per doz. \$18.00, 10¢
Giant, No. 2. \$ per doz. \$15.00, 10¢
Pelican. \$ per doz. \$9.00, 25¢
Eclips. \$ per doz. \$24.00, 40¢
Economy. \$ per doz. \$6.00

Pulleys-

Hot House, Awning, &c. 63¢@70¢

Japaned Screw. 80¢@10¢@10¢

Brass Screw. 70¢

Japaned Side. 80¢@10¢@10¢

Moore's Side, Anti-Friction. 50¢

Moore's Ceiling or End, Anti-Friction. 40¢

Moore's Dumb Water, Anti-Friction. 50¢

Moore's Electric Light. 83¢@5¢

Japaned Clothes Line. 60¢@10¢

Hay Fork, Solid Eye. \$4.00; Swivel. 4¢@50¢

\$4.50 50¢@10¢@10¢@10¢

Hay Fork, "Anti-Friction," 5 in. solid. \$5.70

Hay Fork, "F" Common and Patent Bushed. 50¢

Hay Fork, Tarbox Pat. Iron. 20¢

Hay Fork, Reed's Self-Lubricating. 60¢

Hay Fork, Moore's Anti-Friction 5 in. Wheel. \$ per doz. \$12.00

Shade Rack. 40¢

Tackle Blocks—See Blocks.

Shepard's Niagara, No. 25. \$ per doz. 23¢ net

Sash (Auger Mortise). Common Sense. 60¢

Empire. 60¢

Ideal, Nos. 2, 4, 10 & 15. { 60¢ less 1¢ Acme. } per doz. net.

Star. On odl. lots extra 5¢

Ideal, Nos. 25 and 55. \$ per doz. 22¢ net.

Pumps—

Cistern, Best Makers. 60¢@60¢@10¢

Pitcher Spout, Best Makers. 67¢@70¢

Pitcher Spout, Cheaper G'd's. 75¢@75¢@10¢

Punches—

Saddler's or Drive, good. \$ per doz. 60¢@65¢

Bemis & Call Co.'s Cast Steel Drive. 60¢@65¢

Bemis & Call Co.'s Springfield Socket. 65¢

Spring, good quality. \$ per doz. 50¢@55¢

Spring, Leach's Pat. 15¢

Bemis & Call Co.'s Spring. 50¢@55¢

Bemis & Call Co.'s Check. 50¢@55¢

Solid Tinner's, F. S. & W. Co. \$ per doz. 55¢

Tinner's Hollow Punches, F. S. & W. Co. 20¢@25¢

Rice Hand Punches. 15¢

Avery's Revolving. 40¢

Avery's Sawset and Punch—See Sawset.

Niagara Hollow Punches. 20¢@25¢

Niagara Solid Punches. 50¢

Rail—

Sliding Door, W't Brass. \$ per doz. 55¢, 40¢

Sliding Door, Bronzed W't Iron. 41¢, 36¢

Sliding Door, Iron, Painted. \$ per doz. 45¢, 40¢

Barn Door, Light. 2¢, 3¢, 4¢, 10¢

Per 100 feet. \$2.00 2.50 3.10, 10¢

B.D. for N. E. Hangers—

Small, Med. Large.

Per 100 feet. 33.15 2.70 3.25 Net

Terry's Steel Rail. \$ per ft. 45¢

Victor Track Rail, 7¢ per foot. 40¢@50¢

Carrier, double braced, Steel Rail. 50¢@55¢

Lund's Parlor Door, Planed Edge. 51¢@55¢

Moore's Steel Rail. 25¢@30¢

Moody Steel Rail. 5¢ per ft. 45¢

Rakes—

Cast Steel, Association q'd's. 70¢@70¢@25¢

Cast Steel, outside'd's. 70¢@70¢@25¢

Malleable. 70¢@70¢@25¢

Gibbs' Lawn Rake. \$ per doz. 4.90

Gibbs' Canton Lawn Rake. \$ per doz. 3.75

Gibbs' Acme Lawn Rake. \$ per doz. 4.75

Gibbs' Favorite Lawn Rake. \$ per doz. 3.90

Gibbs' Crown Lawn Rake, No. 1. \$ per doz. 4.90; No. 2, \$5.40

Oneida Lawn Rake. \$ per doz. 6.00

Fort Madison Prize Bow Brace and Peerless. 65¢

Fort Madison Steel Tooth Lawn Rake. \$6.00

Razors—

J. R. Torrey Razor Co. Net prices

Wostenholm and Butcher. \$10 to 20¢. 10¢

Jordan's A.A.I., new list. Net prices

Jordan's Old Faithful, new list. Net prices

Galvanic. \$ per doz. \$16.00

Electric Cutlery Co. Net prices

Campbell Cutlery Co. 60¢

Razor Straps—

See Straps, Razor.

Registers—

Moore's Japaned. 75¢

Moore's Electroplated. 75¢

Moore's Bronze Finishes. 70¢

Moore's Solid Bronze. 65¢

Moore's Stove Pipe. 93¢@3¢

Rings and Ringers—

Bull Rings—

Union Nut Co. 55¢

Sargent's. 75¢@25¢

Hotchkiss' low list. 30¢

Hunsman, Beckley & Co. 70¢@10¢

Peek, Stow & W. Co.'s. 50¢@10¢@50¢@10¢@10¢

Elrich Hdw. Co., White Metal, low list. 50¢@10¢@10¢

Hog—

Top of the Hill Ringers. \$ per doz. \$2.00

Top of the Hill Rings. \$ per doz. \$1.25

Hill's Improved Ringers. \$ per doz. \$1.25

Hill's Old Style Ringers. \$ per doz. \$1.25

Hill's Tongs. \$ per doz. \$3.00

Hill's Rings. \$ per doz. \$1.00

Perfect Ringers. \$ per doz. \$1.50

Blair's Hog Ringers. \$ per doz. \$2.00

Blair's Hog Rings. \$ per doz. \$1.00

Champion Ringers. \$ per doz. \$2.00

Champion Rings, Double. \$ per doz. \$2.25

Brown's Ringers. \$ per doz. \$2.00

Brown's Rings. \$ per doz. \$1.25

Electric Hog Rings. \$ per doz. \$1.50

Electric Hog Ringers. \$ per doz. \$2.00

Major Rings. \$ per doz. \$1.25

Major Ringers. \$ per doz. \$2.00

Rivets and Burrs—

Norway Iron, list Nov. 17, '87. 60¢@10¢

Second quality. 70¢

Copper. 60¢@80¢@10¢

Copper Iron, Bettina Brand. 50¢@25¢

Rivet Sets—See Sets.**Roasting and Baking Pans—See Pans, Roasting and Baking.****Rods—**

Stair, Brass. 25¢@30¢

Stair, Black Walnut. \$ per doz. 40¢

Rollers—

Barn Door, Sargent's list. 60¢@10¢@10¢

Acme Moore's Anti-Friction. 55¢

Union Barn Door Roller. 70¢

Moore's Barn Door Stay. 50¢

Thompson Mfg. Co.'s Lawn Rollers. 30¢

Moore's Electric Light. 83¢@5¢

Japaned Clothes Line. 60¢@10¢

Hay Fork, Solid Eye. \$4.00; Swivel. 4¢@50¢

\$4.50 50¢@10¢@10¢@10¢

Hay Fork, "Anti-Friction," 5 in. solid. \$5.70

Hay Fork, Reed's Self-Lubricating. 60¢

Hay Fork, Moore's Anti-Friction 5 in. Wheel. \$ per doz. \$12.00

Shade Rack. 45¢

Tackle Blocks—See Blocks.

Shepard's Niagara, No. 25. \$ per doz. 23¢ net

Sash (Auger Mortise). Common Sense. 60¢

Empire. 60¢

Ideal, Nos. 2, 4, 10 & 15. { 60¢ less 1¢ Acme. } per doz. net.

Star. On odl. lots extra 5¢

Ideal, Nos. 25 and 55. \$ per doz. 22¢ net.

Ideal, Nos. 25 and 55. \$ per doz. 22¢ net.

Pumps—

Cistern, Best Makers. 60¢@60¢@10¢

Pitcher Spout, Best Makers. 67¢@70¢

Pitcher Spout, Cheaper G'd's. 75¢@75¢@10¢

Punches—

Saddler's or Drive, good. \$ per doz. 60¢@65¢

Bemis & Call Co.'s Cast Steel Drive. 60¢@65¢

Bemis & Call Co.'s Springfield Socket. 65¢

Spring, good quality. \$ per doz. 50¢@55¢

Spring, Leach's Pat. 15¢

Bemis & Call Co.'s Spring. 50¢@55¢

Bemis & Call Co.'s Check. 50¢@55¢

Solid Tinner's, F. S. & W. Co. \$ per doz. 55¢

\$1.4¢ 55¢@55¢

Tinner's Hollow Punches, F. S. & W. Co. 20¢@25¢

Co. 20¢@25¢

Rice Hand Punches. 15¢

Avery's Revolving. 40¢

Avery's Sawset and Punch—See Sawset.

Niagara Hollow Punches. 20¢@25¢

Niagara Solid Punches. 50¢

Rail—

Sliding Door, W't Brass. \$ per doz. 55¢, 40¢

Sliding Door, Bronzed W't Iron. 41¢, 36¢

Sliding Door, Iron, Painted. \$ per doz. 45¢, 40¢

Barn Door, Light. 2¢, 3¢, 4¢, 10¢

Per 100 feet. \$2.00 2.50 3.10, 10¢

B.D. for N. E. Hangers—

Small, Med. Large.

Per 100 feet. 33.15 2.70 3.25 Net

Terry's Steel Rail. \$ per ft. 45¢

Victor Track Rail, 7¢ per foot. 40¢@50¢

Carrier, double braced, Steel Rail. 50¢@55¢

Hand, Panel and Rip. 25¢@10¢@10¢

Cross Cuts, list Jan. 1, 1893. 45¢@45¢@5¢

Woodrough & McParlin. 25¢@10¢@10¢

Hand, Panel and Rip. 30¢@10¢@10¢

Cross Cuts, list Jan. 1, 1893. 45¢@45¢@5¢

Atkins' Circular. 45¢@10¢@10¢

Atkins' Cross Cuts, new list. 40¢@10¢@10¢

Atkins' Mulay, Mill and Drag. 50¢@10¢@10¢

Atkins' One-Man Saw. 40¢@10¢@10¢

Atkins' Wood Saws. 40¢@10¢@10¢

Peace Circular and Mill. 45¢@45¢@5¢

Peace Hand Panel and Rip. 25¢@25¢@5¢

Peace Cross Cuts, list Jan. 1, '93. 45¢@10¢@10¢

Richardson's Circular and Mill. 45¢@45¢@5¢

Richardson's X Cuts, list Jan. 1, '93. 45¢@10¢@10¢

Richardson's Hand. 25¢@25¢@5¢

C. E. Jennings & Co. 25¢@25¢@5¢

Hack Saws—

Griffin's, complete. 40¢@10¢@5¢

Rogers', complete. 40¢@10¢@5¢

Barnes' Builders' and Cab Makers' \$15.25¢

Barnes' Scroll Saw Blades. 35¢@35¢@5¢

Scroll—

Lester, complete. 25¢@5¢

Rogers, complete. 25¢@5¢

Barnes' Builders' and Cab Makers' \$15.25¢

Barnes' Scroll Saw Blades. 35¢@35¢@5¢

Saw Frames—

See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Snaps, Harness, &c.

Anchor (T. & S. Mfg. Co.)	65
Fitch's (Bristol)	50&10%
Hotchkiss	10%
Andrews	50%
Sargent's Patent Guarded	70&10&10%
German, new list	40&10%
Cover	50&10&10%
Cover, New Patent	50&10&10&2%
Cover, New R. E.	60&10&10&2%
Covered Spring	60&10&10%
Cover's Saddlery Works' Triumph	93&14
John Prots Snaps	75&75&5%
Kelley & Woolworth's Steel Harness	50&10&10%

Snaths	
scythe	50&2@50&5&2%

Soldering Irons

See Irons, Soldering.

Splittoons, Cuspidors, &c.	
Standard Fiberware	
Cuspidors, 8½-inch, ½ doz. No. 5, \$8; No. 5X, \$9	
Splittoons, Daisy, 8-inch, No. 1, 1; 10 and 11 inch, \$8	

Spoke Shaves

See Shaves, Spoke.

Spoke Trimmers

See Trimmers, Spoke.

Spoons and Forks**Tinned Iron**

Basting, Cen. Stamp. Co.'s list	70&10%
Sold Table and Tea, Cen. Stamp. Co.'s list	70&10%
Buffalo, S. S. & Co.	33&2&2%

Silver Plated

4 months or 5% cash 30 days:	
Meriden Brit. Co., Rogers	40&15%
Rogers & Hamilton	40&15%
C. Rogers & Bros.	40&15%
Rogers & Bros.	40&15%
Reed & Barton	40&40&5%
Wm. Rogers Mfg. Co.	40, 15&5%
Simpson, Hall, Miller & Co.	40, 15&5%
Holmes & Edwards Silver Co.	40, 15&5%
L. Boardman & Son.	50&12&5%

Miscellaneous

Holmes & Edwards Silver Co.:	
No. 9 Mexican Silver	50&10&5%
No. 30 Silver Metal	50&10&5%
No. 24 German Silver	50&10&5%
No. 50 Nickel Silver	50&5%
No. 19 Nickel Silver	50&10&5%
Wm. Rogers Mfg. Co.:	
Rogers' Silver Metal	50&10&5%
18% Rogers' German Silver	60&6%
22% Rogers' Nickel Silver	50&6%
Rogers & Hamilton:	
Steel Goods	40&10%
Cimeta, Flatware	40&15&5%
Cimeta, Steel Goods	40&10%
Crown Hamilton, Flatware and Cutlery	30%
German Silver	50&50&5%
Nickel Silver	50&50&5% cash
Britannia	60&60&5%
Boardman's Nickel Silver, list July 1, 1891	60&75&6%
Boardman's Britannia Spoons, case lots	60&6% cash

Springs**Door**

Torrey's Rod, 99 in.	5 doz \$1.20@1.2
Warner's No. 1, 5 doz \$1.50; No. 2, \$3.40	55@55&10%
Gem (Coil), list April 19, 1886, 20%	
Star (Coil), list April 19, 1886, 20&10%	
Victor (Coil)	60&10@60&10&5%
Champion (Coil)	60&10@60&10&10%
Cowell's, No. 1, 5 doz \$1.80; No. 2, \$1.50	50&50&10%
Rubber, complete, 5 doz \$4.50, 55&10%	
Hercules	50&50&10%
Phoenix	33&3%

Carriage, Wagon, &c.

Elliptic, Concord, Platform and Half Scroll	
60&10@60&10&10 or net prices	
Cliff's Bolster Springs	25%

Squares

Steel Iron	50&10&10@80&25%
Nickel-Plated	
Try Square and T Bevels	60&10&10%
Disslon's Try Square and T Bevels	50%
Winterbottom's Try and Miter	30&10%
Starrett's Micrometer Caliper Squares	25%

Avery's Flush Bevel Squares**Avery's Bevel Protractor**

Squeezers	
Fodder	

Blair's	5 doz \$2.00
Blair's 'Climax'	5 doz \$1.25

Lemon

Porcelain Lined, No. 1	5 doz \$6.00
	25&30%

Wood, No. 2	5 doz \$3.00, 35%
	25&30%

Wood, Common	5 doz \$1.70@1.75
	25&30%

Dunlap's Improved	5 doz \$3.76, 20%
	25&30%

Sammis' No. 1, \$5.00; No. 2, \$9; 12	18 2 doz
	25&30%

Jennings' Star	5 doz \$2.50
	25&30%

The Boss	5 doz \$2.50
	25&30%

Little Giant	5 doz \$1.50
	25&30%

Hotchkiss Straight Flash	5 doz \$12.00
	25&30%

Blair's Co. Glass	5 gro. \$8.00
	25&30%

Standard Fiber Ware	
See Ware, Standard Fiber.	

Spikes

Barbed Blind, 5 in. and larger	50&70@74
	25&30%

Barbed Blind, 5 in.	50&80@84
	25&30%

Fence Staples, Galvanized	50&10&10%
	25&30%

Common and Patent Brads	50&10&10%
	25&30%

Leathered Tacks	50%
	25&30%

Brush Tacks, S. S.	60%
	25&30%

Looking Glass Tacks, S. S.	60%
	25&30%

Picture-Frame Points, S. S.	60%
	25&30%

Finishing Nails	60%
	25&30%

Trunk and Clout Nails	60%
	25&30%

Black	65%
	25&30%

Tinned or Coppered	67%
	25&30%

Brass Tacks	60%
	25&30%

Chair Nails	60%
	25&30%

Cigar Box Nails	60%
	25&30%

Tim Capped Nails	50%
	25&30%

Miscellaneous	
Double Point	90&10@90&10@10%

Wire Carpet Nails	60&10%
	25&30%

Claw Handle Carpet	gross \$4.00
	25&30%

Bonnie Blue	box \$1.50
	25&30%

McGill's, 5 doz \$8.

Whips

American Whip Co.: Length.	4 ft	5	5½	6	6½	7	7½	8 ft.
X. L. Whalebone Driving.	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone.	.....	16.00	16.50	18.00	20.00	.....	.....	.....
Bull Bone, Half-length Whalebone.	.....	.....	.....	.....	.....	.....	.....	.....
American Standard.	8.00	8.50	11.00	12.00	13.00	15.00	16.00	16.50
True Grip, Raw Hide Center.	8.00	8.00	6.50	7.00	7.50	9.00	.....	.....
New Name, Stocked Java, Black and Wine Colors.	.....	.....	.....	6.00	.....	.....	.....	.....
American, 99 Pen Whip.	.....	.....	.....	6.00	.....	.....	.....	.....
Gents' Light Driving, No. 111.	.....	.....	.....	6.00	.....	.....	.....	.....
Gents' Light Driving, No. 100.	.....	.....	.....	6.00	.....	.....	.....	.....
Hand-made Stocked Java No. 108.	.....	8.75	4.00	.....	.....	.....	.....	.....
A large variety of cheaper grades.	.....	.....	.....	.....	50¢@83.00	.....	.....	.....
Team Whips.	.....	.....	.....	.....	.....	52¢@75.00	.....	.....
Toy Whips.	.....	.....	.....	.....	.....	.....	52¢@75.00	.....
Hardware Assortment, 10/American, 75 Whips for \$50.00.	.....	.....	.....	.....	.....	.....	W. gro. \$2.50@12.00	.....

Per dozen.

Ossawan Mills, Brass and Copper on Spools.	50¢@10%	Bemis & Call's: Pat. Combination Bright.	40¢@5%
Tate's Spooled, Tin'd & Annealed.	60¢@5%	Pat. Combination Black.	40¢@10%
Tate's Spooled Cop. and Brass.	60¢	Merrick's Pattern.	45¢
Cast Steel Wire.	60¢	Briggs's Pattern.	30¢@10%
Stubs' Steel Wire.	60¢ to 2, 50¢	Cylinder or Gas Pipe.	45¢@5%
Steel Music Wire, 12 to 30, imported.	60¢@70¢	No. 3 Pipe.	55¢
Wire Clothes Line, see Lines.	.....	Aiken's Pocket (Bright).	\$6.00, 50¢@10%
Wire Picture Cord, see Cord.	.....	Pat. Favorite Pocket.	.....
Bright Wire Goods—	.....	.....	40¢@25%
Standard list.	85¢@10@25¢@10@10%	Boardman's.	30¢
Wire Cloth and Netting—	.....	Always Ready.	25¢@5%
Painted Screen Cloth 100 ft.	.....	Alligator.	50¢
Galvanized Wire Netting.	.....	Donohue's Engineer.	20¢@10%
75¢@70¢@10%	75¢@10@75¢@10@5%	Eagle.	50¢@10%
Acme, Bright.	50¢@2%	Acme, Nickeled.	40¢@2%
Hercules.	70¢@75¢@5%	Walker's.	55¢@3%
Diamond Steel.	55¢@3%	Cincinnati Brace Wrenches.	25¢@10%
Taft's Vise Wrench.	55¢@10@3%	W. & B. Diamond.	.....

Wire and Wire Goods—**Iron—**

Market,	.....
Br. & Ann., Nos. 0 to 18.	Extra 5¢@10%
75¢@10@75¢@10@5%	Br. & Ann., Nos. 0 to 18.
Cop'd, Nos. 0 to 18.	5¢@5%
Galv., Nos. 0 to 18.	5¢@5%
70¢@5@70¢@10%	Br. & Ann., Nos. 0 to 18.
Tin'd, Tin'd list, Nos. 0 to 18.	70¢@70¢@10%

Stone,
Br. and Ann'd,
Nos. 16 to 18.....
Nos. 19 to 26.....
Nos. 27 to 36.....
80¢@5%
82¢@4@5%
83¢@3@5%
84¢@2@5%
85¢@1@5%
86¢@1@5%
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CURRENT METAL PRICES.

NOVEMBER 8, 1893.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron:	
3/4 to 2 in. round and square.	3 lb 1.80 @ 1.90¢
1 to 6 in. x 3/8 to 1 in.	
Refined Iron:	
3/4 to 2 in. round and square.	3 lb 1.90 @ 2.00¢
1 to 4 in. x 3/8 to 1 1/4 in.	
4 1/2 to 6 in. x 3/8 to 1 in.	
1 to 6 in. x 1/2 and 5-16.	3 lb 2.10 @ 2.20¢
Rods—3/4 and 11-16 round and sq.	3 lb 2.00 @ 2.10¢
Bands—1 to 6 x 3-16 to No. 12.	3 lb 2.20 @ 2.30¢
"Burden Best" Iron, base price.	3 lb
Burden's "H. B. & S." Iron, base price.	2.80¢
"Ulster"	3 lb
Norway Bars.	3.75 @ 4.00¢
Norway Shapes.	4.50 @ 5.00¢

Merchant Steel from Store—

Per lb

Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.	23¢
Best Cast Steel, base price in small lots.	8¢
Best Cast Steel Machinery, base price in small lots	5¢

Sheet Iron from Store—

Black—

Best Refined Iron.

Nos. 14 to 20.	3 @ 34¢
21 to 24.	3 1/4 @ 34¢
25 to 26.	3 1/2 @ 34¢
27.	3 1/2 @ 35¢
28.	3 1/2 @ 34¢

Common 3/4 less than the above.

Open Hearth Steel.

Best Soft Steel, Nos. 14 to 16.	2 1/2 @ 23¢
" " " 18 to 20.	2 1/2 @ 3¢
" " " 21 to 24.	3 1/4 @ 34¢
" " " 25 to 26.	3 1/2 @ 34¢
" " " 27 to 28.	3 1/2 @ 35¢

Best Bloom Sheets, 3/4 extra over above prices. Best Bloom, Galvanized, Jobbing dis. 70 @ 70 & 5% Ordinary Bessemer, 3/4 @ 34¢ lower than above prices.

Russia, Planished, &c.

Genuine Russia, according to assortment.	3 lb 12¢ @ 13¢
Patent Planished.	3 lb A, 10¢; B, 9¢, 5¢
Craig Polished Sheet Steel.	3 lb, 8¢

English Steel from Store—

Best Cast.	3 lb 15¢
Extra Cast.	3 lb 16¢ @ 17¢
Swaged, Cast.	3 lb 16¢
Best Double Shear.	3 lb 15¢
Blister, 1st quality.	3 lb 12¢
German Steel, Best.	3 lb 10¢
2d quality.	3 lb 9¢
3d quality.	3 lb 8¢
Sheet Cast Steel, 1st quality.	3 lb 15¢
2d quality.	3 lb 14¢
3d quality.	3 lb 12¢
R. Musket's "Special".	3 lb 48¢
" " " Annealed.	3 lb 75¢
" " " " " Titanic".	3 lb 20¢

METALS—

Tin—

Per lb

Banca, Pigs.	22¢
Straits, Pigs.	21¢ @ 21¢
Straits in Bars.	22 1/2¢

Tin Plates—

Duty: 2 1/2¢ lb.

Charcoal Plates—Bright—Guaranteed Plates command special prices, according to quality. Per box.

Melyn and Calland Grade. IC, 10 x 14.	3 lb \$6.00
" " " IC, 12 x 12.	3 lb 8.75¢
" " " IC, 14 x 20.	3 lb 6.50¢
" " " IC, 20 x 28.	3 lb 13.00¢
" " " IX, 10 x 14.	3 lb 8.50¢
" " " IX, 12 x 12.	3 lb 8.75¢
" " " IX, 14 x 20.	3 lb 8.50¢
" " " IX, 20 x 28.	3 lb 17.00¢
" " " DC, 12 x 17.	3 lb 6.00¢
" " " DC, 12 x 17.	3 lb 6.00¢
" " " DX, 12 x 17.	3 lb 8.00¢
Allaway Grade.	3 lb 6.00¢
" " " IC, 10 x 14.	3 lb 6.25¢
" " " IC, 12 x 12.	3 lb 6.00¢
" " " IC, 20 x 28.	3 lb 12.00¢
" " " IX, 10 x 14.	3 lb 7.50¢
" " " IX, 12 x 12.	3 lb 7.75¢
" " " IX, 14 x 20.	3 lb 7.50¢
" " " IX, 20 x 28.	3 lb 15.00¢
" " " DC, 12 x 17.	3 lb 5.50¢
" " " DX, 12 x 17.	3 lb 7.00¢

Coke Plates—Bright—

Steel Coke. -IC, 10 x 14.	3 lb \$6.40
10 x 20.	3 lb 8.50¢
20 x 28.	3 lb 11.50¢
IX, 10 x 14.	3 lb 7.00¢
BV Grade -IC, 10 x 14.	3 lb 5.50¢

Charcoal Plates—Terne—Guaranteed Plates command special prices according to quality.

Dean Grade. -IC, 14 x 20.	3 lb 5.65¢
20 x 28.	3 lb 11.00¢
IX, 14 x 20.	3 lb 6.40¢
20 x 28.	3 lb 12.80¢
Abecarne Grade. -IC, 14 x 20.	3 lb 5.55¢
20 x 28.	3 lb 10.75¢
IX, 14 x 20.	3 lb 6.40¢
20 x 28.	3 lb 12.80¢

Tin Boller Plates—

IX, 14 x 26.	112 sheets.
IX, 14 x 28.	112 sheets.
IX, 14 x 31.	112 sheets.

American Terne Plates. -Apollo. IC, 14 x 20.	12.25
IC, 20 x 28.	12.50
IX, 14 x 20.	7.25
IX, 2 x 28.	14.50

THE IRON AGE.

NOVEMBER 8, 1893.

Copper—

DUTY: Pig, Bar and Ingot, 1 1/4¢; Old Copper, 1¢ lb. Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad valorem.

Ingot—

Lake.

Ansonia grade Arizona.

Ansonia grade Casting.

Sheet and Bolt—

Prices adopted by the Association of Copper

Manufacturers of the United States, May

19, 1892. Subject to a discount of 15% @ 25%, according to size of order. Stubs' gauge

standard.

Weights per sq. foot and prices per pound.

Not wider than	Not longer than	Weights per sq. foot and prices per pound.									
		Over 64 oz.	32 oz.	28 oz.	24 oz.	20 oz.	16 oz.	12 oz.	10 oz.	8 oz.	Less than
20	72	22	22	22	24	25	28	30			
30	72	22	22	22	25	27	31	35			
36	96	22	22	22	25	27	31	35			
48	96	22	22	22	25	27	31	35			
60	96	22	22	22	27	34					
84	96	23	23	23							
Ov'r 84 in. wide		24	25								
		25	27								

Bolt Copper, 3/4 inch diameter and over, 3 lb 22¢

Circles, Segments and Pattern Sheets, 60 in.

diameter and less, 3¢ lb advance over prices

of Sheet Copper required to cut them from.

Circles, Segments and Pattern Sheets, over 60

in. diameter, up to 96 in. diameter inclusive,

4¢ lb advance over prices of Sheet Copper

required to cut them from.

Circles, Segments and Pattern Sheets, over 96

in. diameter, 5¢ lb advance over prices of

Sheet Copper required to cut them from.

Cold or Hard Rolled Copper 1/4 oz. per square foot

and heavier, 12¢ lb over the foregoing prices.

Cold or Hard Rolled Copper lighter than 1/4 oz. per square foot, 2¢ lb over the foregoing prices.

All Polished Copper over 20 in. wide, 2¢ lb

advance over the foregoing prices.

Copper Bottoms, Pits and Flats—

Per lb. 14 oz. to square foot and heavier.

12 oz. and up to 14 ounce to square foot.

10 ounce and up to 12 ounce.

Lighter than 10 ounce.

Circles less than 8 inches diameter, 2¢ lb ad-

ditional.

Circles over 12 inches diameter are not classed

as Copper Bottoms.

15% @ 25% discount, according to size of order.

Copper Wash Bowl Bottoms—

Tinned.

Per lb. 34¢, 15¢ @ 25% discount.

Tinning—

Net.

Tinning sheets on one side, 10, 12 and 14 x 48

each.

Tinning sheets on one side, 30 x 60 each.

For tinning boiler sizes, 9 in. (sheets 14 in x 60

in.), each.

For tinning boiler sizes, 8 in. (sheets 14 in x 56

in.), each.

For tinning boiler sizes, 7 in. (sheets 14 in x 52

in.), each.

Tinning sheets on one side, other sizes, per

square foot.

For tinning both sides double the above prices.

Not larger than 30 x 60.

24 oz.

25 oz.

27 oz.

30 oz.

32 oz.

35 oz.

38 oz.

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